STATE OF CALIFORNIA

The Resources Agency

Department of Water Resources

BULLETIN No. 91-17

WATER WELLS AND SPRINGS IN PANAMINT, SEARLES, AND KNOB VALLEYS

SAN BERNARDINO AND INYO COUNTIES CALIFORNIA

Prepared by
United States Department of Interior
Geological Survey

FEDERAL-STATE COOPERATIVE GROUND WATER INVESTIGATIONS

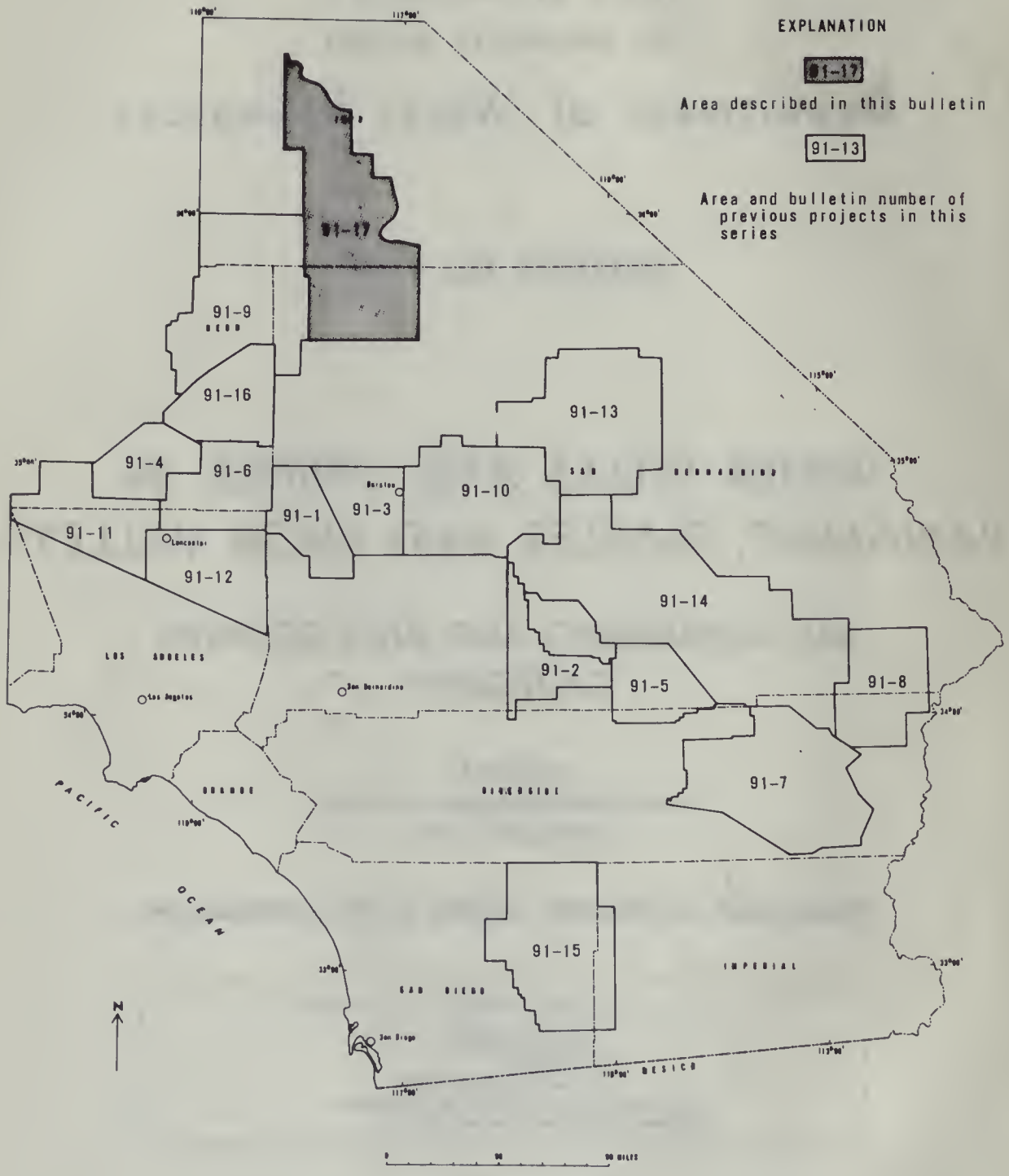
Copies of this bulletin at $2.00 each may be ordered from:
Office of Procurement
DOCUMENTS SECTION
P.O. Box 20191
Sacramento, California 95820
Make checks payable to STATE OF CALIFORNIA.
California residents add 5 percent sales tax.

DECEMBER 1969

NORMAN B. LIVERMORE, JR.
Secretary for Resources
The Resources Agency

RONALD REAGAN
Governor
State of California

WILLIAM R. GIANELLI
Director
Department of Water Resources



PART OF SOUTHERN CALIFORNIA SHOWING AREA DESCRIBED IN THIS AND PREVIOUS BULLETINS OF THE NO. 91 SERIES

ABSTRACT

This bulletin is one of a series on water wells and springs in southern California desert areas. The series is prepared by the U.S. Geological Survey and published by the California Department of Water Resources.

Each bulletin locates water wells and springs in a part of the southern California desert region; describes well depth and yield, water use and level on dates observed; names the well owner; provides pumping data, including depths, rates, static water levels, drawdowns, and specific capacities; and lithologic data from drillers' well logs.

Earlier bulletins in the series are:

Bulletin No. 91-1: Data on Wells in the West Part of the Middle Mojave Valley Area, San Bernardino County, California. June 1960; 126 p. [Out of print]

91-2: Data on Water Wells and Springs in the Yucca Valley-Twentynine Palms Area, San Bernardino and Riverside Counties, California. June 1960; 164 p. [Out of print]

91-3: Data on Water Wells in the Eastern Part of the Middle Mojave Valley Area, San Bernardino County, California. August 1960; 223 p. [Out of print]

91-4: Data on Water Wells in the Willow Springs, Gloster, and Chaffee Areas, Kern County, California. September 1960; 90 p. [$1.50 a copy]

91-5: Data on Water Wells in the Dale Valley Area, San Bernardino and Riverside Counties, California. March 1961; 60 p. [$1.50 a copy]

91-6: Data on Wells in the Edwards Air Force Base Area, California. June 1962; 212 p. [$3.00 a copy]

91-7: Data on Water Wells and Springs in the Chuckwalla Valley Area, Riverside County, California. May 1963; 78 p. [Out of print]

91-8: Data on Water Wells and Springs in the Rice and Vidal Valley areas, Riverside and San Bernardino Counties, California. May 1963; 36 p. [Out of print]

91-9: Data on Water Wells in Indian Wells Valley Area, Inyo, Kern, and San Bernardino Counties, California. May 1963; 246 p. [$4.00 a copy]

91-10: Data on Wells and Springs in the Lower Mojave Valley Area, San Bernardino County, California. December 1963; 212 p. [$3.00 a copy]

91-11: Data on Water Wells in the Western Part of the Antelope Valley Area, Los Angeles and Kern Counties, California. May 1965; 278 p. [$1.50 a copy]

91-12: Data on Water Wells in the Eastern Part of the Antelope Valley Area, Los Angeles County, California. December 1966; 448 p. [$4.75 a copy]

91-13: Water Wells and Springs in Soda, Silver, and Cronise Valleys, San Bernardino County, California. August 1967; 80 p. [$1.00 a copy]

91-14: Water Wells and Springs in Bristol, Broadwell, Cadiz, Danby, and Lavic Valleys and Vicinity, San Bernardino and Riverside Counties, California. August 1967; 80 p. [$1.50 a copy]

91-15: Water Wells and Springs in Borrego, Carrizo, and San Felipe Valley Areas, San Diego and Imperial Counties, California. January 1968; 142 p. [$2.00 a copy]

91-16: Water Wells and Springs in the Fremont Valley Area, Kern County, California. February 1969; 158 p. [$2.00 a copy]

To purchase the bulletins, send order to:

Office of Procurement
DOCUMENTS SECTION
P.O. Box 20191
Sacramento, California 95820

Make checks payable to STATE OF CALIFORNIA.
California residents add 5 percent sales tax.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Water Resources Division
District Office
855 Oak Grove Avenue
Menlo Park, California 94025

January 10, 1969

Mr. William R. Gianelli, Director
Department of Water Resources
State of California--Resources Agency
Post Office Box 388
Sacramento, California 95802

Dear Mr. Gianelli:

We are pleased to enclose, for publication by the Department of Water Resources, the U.S. Geological Survey report on "Water Wells and Springs in the Panamint, Searles, and Knob Valleys, San Bernardino and Inyo Counties, California," by W. R. Moyle, Jr.

This report--one of a series on the desert region of southern California--was prepared by our Garden Grove subdistrict office, in accordance with the cooperative agreement between the State of California and the U.S. Geological Survey. It tabulates all available data on wells and springs in the indicated area and contains maps showing the location of wells and springs and the reconnaissance geology with special reference to the water-yielding deposits.

Very truly yours,

R. Stanley Lord

R. Stanley Lord
District Chief

FOREWORD

Previous Investigations and Acknowledgments

Data on ground water in Panamint, Searles, and Knob Valleys are contained in three U.S. Geological Survey Water-Supply Papers: Waring (1915) and Thompson (1921 and 1929). The data are included in the tables in this bulletin, as is information supplied by the California Department of Water Resources, the American Potash and Chemical Co., and Stauffer Chemical Co.

The geology, shown in this bulletin, is generalized after published mapping by Hall and Stephens (1962), Hall and MacKevett (1962), McAllister (1956), Smith (1964), and Johnson (1957), and unpublished mapping of part of Panamint Valley by Carranza (1965) and Searles Valley and the Slate Range by George I. Smith (oral commun., 1967).

Well-log data are included in this bulletin from previously published reports by Haines (1959), Gale (1915), and Smith and Pratt (1957).

The cooperation and assistance given by many well owners and others who contributed materially to the completeness of the data presented in this bulletin are gratefully acknowledged.

Purpose and Scope of the Investigation

The data in this bulletin were collected by the U.S. Geological Survey, in cooperation with the California Department of Water Resources, as a phase of the investigation of water wells and springs and general hydrologic conditions throughout much of the desert region of southern California.

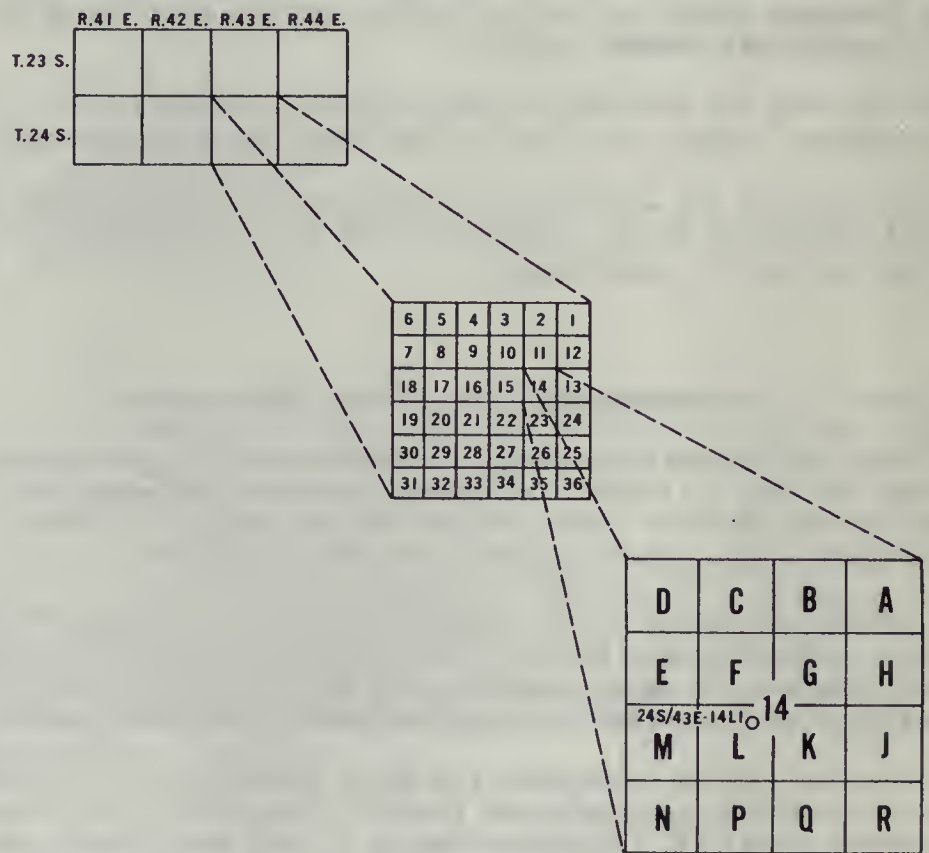
The general objective of the investigation is to collect and tabulate all available ground-water data for the individual desert basins in order to provide public agencies and the general public with data for overall ground-water investigation of the area and for planning water utilization and development work.

The scope of the work includes (1) brief reconnaissance of major geologic features to determine the extent and general character of the deposits that contain ground water; (2) field examination of most water wells and springs in the area to determine their location with respect to the geographic and cultural features and the public-land net and to record well depths and sizes, types and capacities of pumping equipment, uses of the water, and other pertinent information available at the well site; (3) measurement of the depth to water below land surface; (4) selection of representative wells to be measured periodically to detect and record changes of water level; and (5) collection and tabulation of well and spring records, including well logs, water-level measurements, chemical analyses, and pumping-test data.

The work was done intermittently in 1966 and 1967 by the Water Resources Division of the Survey, under the general supervision of R. Stanley Lord, district chief for California, and under the immediate supervision of L. C. Dutcher, chief of the Garden Grove subdistrict office.

Well- and Spring-Numbering System

Wells and springs are numbered according to their location in the rectangular system for the subdivision of public land. For example, in the number 24S/43E-14L1, the part of the number preceding the slash indicates the township (T. 24 S.), the part between the slash and the hyphen indicates the range (R. 43 E.), the number between the hyphen and the letter indicates the section (sec. 14), and the letter indicates the 40-acre subdivision of the section. Within the 40-acre tract wells are numbered serially, as indicated by the final digit. Thus, well 24S/43E-14L1 is the first well to be listed in the NE¼SW¼ sec. 14, T. 24 S., R. 43 E., Mount Diablo base line and meridian as shown in the diagram below:



On maps most wells and springs are identified by the letter designation and final digit. Some wells show the section number as well as the letter designation and final digit. These wells were previously located correctly with relation to cultural features but were not numbered correctly because of improperly projected land net. These wells have retained their original well number so that old published well data can be used.

Springs are numbered similarly except that an S is placed between the 40-acre subdivision letter and the final digit as shown in the following spring number: 23S/42E-13PS1.

WATER WELLS AND SPRINGS IN PANAMINT, SEARLES, AND KNOB VALLEYS

SAN BERNARDINO AND INYO COUNTIES, CALIFORNIA

By W. R. Moyle, Jr.

CONTENTS

ILLUSTRATIONS

TABLES

GENERAL FEATURES

Panamint, Searles, and Knob Valleys cover about 1,800 square miles, between long 116°55' and 117°35' W. and lat 35°30' and 36°40' N. The southern boundary of the area is along lat 35°30' N. The southeastern boundary is the San Bernardino meridian. The northeastern boundary is the western edge of Death Valley National Monument. The northern boundary is the surface-water drainage divide between Saline and Panamint Valleys. The southwestern boundary coincides with part of the eastern boundary of the Indian Wells Valley area (Moyle, 1963) and the northwestern boundary is approximately the drainage divide along the crest of the Argus Range.

The main population center is in Searles Valley and is a cluster of small towns that include Argus, Trona, Pioneer Point, and Westend. The total population is about 3,000. The town of Ballarat and the Panamint Springs Resort are the main population centers in Panamint Valley with a probable total permanent resident population of less than 20 people. A few miners and prospectors live in the surrounding hills. Access to the area is provided by the Trona Highway (State Highway 178) and many paved and unpaved roads.

The base maps were compiled at a scale of 1:62,500 from all or parts of the following U.S. Geological Survey topographic quadrangle maps: Darwin, Manly Peak, Marble Canyon, Maturango Peak, Panamint Butte, Quail Mountains, Searles Lake, Telescope Peak, Trona, Ubehebe Peak, Wingate Pass, and Wingate Wash.

GEOLOGIC AND HYDROLOGIC FEATURES

Geologic Units and Their Water-Bearing Character

The geologic formations in Panamint, Searles, and Knob Valleys are divided into two main groups, the consolidated rocks and the unconsolidated deposits. The formations within these groups have dissimilar water-bearing characteristics but, in general, the unconsolidated deposits of Quaternary age are more porous and permeable than the consolidated rocks of pre-Tertiary, Tertiary, and Quaternary age. The unconsolidated deposits generally underlie the valleys and contain most of the ground water stored in the area. The consolidated rocks form the mountains and hills, surround the valley areas, underlie the unconsolidated deposits, and form the sides and bottoms of the ground-water basins. The consolidated rocks, for all practical purposes, are impermeable, but are important because they form the mountains and hills which receive the major part of the precipitation within the drainage areas. The runoff from those mountains and hills contributes the major part of the recharge to the ground-water bodies contained in the unconsolidated deposits. In the following paragraphs the geologic units shown in the geologic maps are described with special reference to their water-bearing characteristics.

The oldest rocks in the area are in the pre-Tertiary basement complex which consists of undifferentiated igneous, metamorphic, sedimentary, and metavolcanic rocks, principally limestone, marble, dolomite, quartzite, shale, quartz monzonite, diorite, granodiorite, granite, rhyolite, andesite, phyllite, amphibolite, slate, siltstone, sandstone, and conglomerate. The formations include the Atolia Quartz Monzonite, Kingston Peak Formation, Noonday Dolomite, Johnnie Formation, Stirling Quartzite, Wood Canyon Formation, Lotus Formation of Johnson (1957), Anvil Spring Formation of Johnson (1957), Butte Valley Formation of Johnson (1957), Warm Spring Formation of Johnson (1957), Pogonip Group, Owens Valley Formation, Keeler Canyon Formation, Eureka Quartzite, Ely Springs Dolomite, Lost Burro Formation, Tin Mountain Limestone, Perdido Formation, Lee Flat Limestone, and the Hunter Mountain Quartz Monzonite. The basement complex is generally impermeable except in fractures, weathered zones, joints, and bedding planes that may yield small quantities of water.

The continental sedimentary rocks of Pliocene and Pleistocene age consist of moderately to well-bedded conglomerate, fanglomerate, and sandstone. South of the Garlock fault, the unit includes the Bedrock Spring Formation (Smith, 1964). No wells are known to yield water from the unit.

The volcanic rocks of Pliocene and Pleistocene age include rhyolite tuff, basalt agglomerate, andesite and basalt flows, with some volcanic breccia, and pyroclastic rocks. The volcanic rocks yield small quantities of water to wells in fractured zones. The olivine basalt is Pleistocene in age. In parts of the area the basalt overlies older volcanic rocks and in other areas it rests directly upon the Tertiary or pre-Tertiary units. In all areas the basalt is unconformable with the underlying material and lies above the regional water table. The basalt is therefore not an aquifer.

The older alluvium, of Pleistocene age, consists mainly of moderately well sorted sand, gravel, silt, and clay. It underlies much of Searles Valley north of the Wilson Canyon fault and Searles Lake. In places the older alluvium is covered by a veneer of younger material, and in other places the older alluvium is interbedded with the older lake deposits. The alluvium is porous and permeable, extends below the water table, yields water freely to wells, and is the principal fresh-water-bearing unit in Searles Valley north of the Wilson Canyon fault.

The older fan deposits, of Pleistocene age, are composed of moderately consolidated and moderately well bedded sand, gravel, and boulders derived from the surrounding mountains. The deposits include the Christmas Canyon Formation along the Garlock fault. The deposits, where saturated, yield water to wells.

The older lake deposits, of Pleistocene age, are composed of moderately consolidated clay, silt, sand, tufa, and beds of salt. In the areas of Panamint and Searles Lakes, wells yield moderate quantities of brine for commerical use.

The younger alluvium, of Holocene age, consists of unconsolidated sand with small quantities of gravel, silt, and clay. Deposition of this material is still taking place in the valley areas during times of streamflow. The unit is permeable and, where saturated, will yield water to wells. It is very thin and is not an important water-bearing unit, because it generally lies above the water table. However, it does transmit precipitation and water from the intermittent streams to the ground-water body.

The younger fan deposits are of Holocene age. They consist of unconsolidated angular boulders, cobbles, and gravel with small quantities of sand and silt derived from and occurring along the toe of the local mountain areas. The deposits are generally very poorly sorted. The unit occurs above the regional water table and is not an important aquifer.

The playa deposits, of Holocene age, are composed of clay, silt, and sand with various quantities of soluble salts. Of the three major playas and the several minor playas only Searles and South Panamint Lakes have areas of discharging ground water. The water levels beneath the discharging playas, are at or near land surface, allowing water to evaporate into the air, leaving a residue of salt behind. The playa deposits in general may yield moderate quantities of water to wells, but the quality ranges from fair to poor, depending on the source area and the purpose for which it is used.

The windblown sand, of Holocene age, is composed of actively drifting fine to medium sand, ranging from a few feet to more than 25 feet in thickness. The sand is generally above the water table and is not considered to be an aquifer.

Recharge and Discharge of Ground Water

Recharge to the ground-water body in the area occurs by direct infiltration of rain, subsurface flow from the adjoining areas, and percolation of the infrequent runoff which occurs during flash floods from the surrounding mountains. During the fieldwork for this bulletin, flash flooding occurred in Darwin Wash, Wildrose Canyon (T. 19 S., R. 44 E., not shown), and Salt Wells Canyon and caused considerable damage to the roads.

Searles Valley is a closed structural basin which allows no water to escape except by pumping or evaporation. Analyses of water samples from beneath Searles Lake range between about 12,000 to 420,000 ppm (parts per million) in salts. Salt companies in Searles Valley pump more than 5 million gallons per day of brine for the production of salts and chemicals. North of Searles Lake, near Valley Wells and to the north, fresh to brackish ground water has been obtained for many years; however, the water from some of the wells is becoming more salty due to the lowering of water levels. In the center of the pumping depression at Valley Wells the decline in water level between 1917 and 1967 has been about 110 feet.

Panamint Valley is also a closed structural basin. From the meager data available, it is the opinion of the author that no water entering Panamint Valley escapes except by evaporation. Only a small quantity of ground water is being pumped. Water in Panamint Valley beneath South Panamint dry lake is very salty, containing as much as 272,000 ppm. In some places fresh water can be obtained from shallow wells near the edge of the dry lake, but in general most water produced from deep wells is salty.

Knob Valley, referred to as Randsburg Wash by the U.S. Navy, contains three wells that indicate moderate quantities of potable water can be obtained from the area. Water from Knob Valley discharges across the Garlock fault northward toward South Panamint dry lake.

GEOPHYSICAL INVESTIGATION

The geophysical traverses shown on the geologic maps were made to detect the Wilson Canyon fault in areas covered by alluvium. Faults act as barriers to the movement of ground water in the alluvium. The exact position of the fault is needed to determine direction of ground-water flow. During the investigation, four magnetometer traverses were made with a flux-gate magnetometer (607222).

The instrument reads the total magnetic field directly in gammas. The data were not reduced to a regional datum because isolated profiles were not related to a common base station. The data in each case were used to determine local discontinuities in the magnetic field, presumably caused by faulting.

The data used for projecting faults across the alluvial-filled basins can be inspected at the U.S. Geological Survey office in Garden Grove, Calif.

SELECTED REFERENCES

Carranza, Carlos, 1965, Surficial geology of a portion of South Panamint Valley, Inyo County, California: Amherst, Massachusetts Univ., M. A. thesis.

Gale, H. S., 1915, Salines in the Owens, Searles, and Panamint basins, southeastern California, *in* Contributions to economic geology: U.S. Geol. Survey Bull. 580-L, p. 251-323.

Haines, D. V., 1959, Core logs from Searles Lake, San Bernardino County, California: U.S. Geol. Survey Bull. 1045-E, p. 139-317.

Hall, W. E., and MacKevett, E. M., Jr., 1962, Geology and ore deposits of the Darwin quadrangle, Inyo County, California: U.S. Geol. Survey Prof. Paper 368, 87 p.

Hall, W. E., and Stephens, H. G., 1962, Preliminary geologic map of the Panamint Butte quadrangle, Inyo County, California: U.S. Geol. Survey Mineral Inv. Field Studies Map, MF-251.

Johnson, B. K., 1957, Geology of a part of the Manly Peak quadrangle, southern Panamint Range, California: California Univ. Pub. Geol. Sci., v. 30, no. 5, p. 353-424, pls. 43-49.

McAllister, J. F., 1956, Ubehebe Peak, California, geology: U.S. Geol. Survey Geol. Quad. Map, GQ-95.

Smith, G. I., 1964, Geology and volcanic petrology of the Lava Mountains, San Bernardino County, California: U.S. Geol. Survey Prof. Paper 457, 97 p. [1965].

Smith, G. I., and Pratt, W. P., 1957, Core logs from Owens, China, Searles, and Panamint basins, California: U.S. Geol. Survey Bull. 1045-A, p. 1-62.

Thompson, D. G., 1921, Routes to desert watering places in the Mohave Desert region, California: U.S. Geol. Survey, Water-Supply Paper 490-B, p. 87-269.

_____1929, The Mohave Desert region, California, a geographic, geologic, and hydrologic reconnaissance: U.S. Geol. Survey Water-Supply Paper 578, 759 p.

Waring, G. A., 1915, Springs of California, U.S. Geol. Survey Water-Supply Paper 338, 410 p.

TABLE 1.--*Description of wells and springs*

[Boxhead explanations are abstracted from U.S. Geological Survey "Instructions for Using the Punch-Card System for the Storage and Retrieval of Ground-Water Data"]

State well number: The wells are identified according to their location in the rectangular system for the subdivision of public land. The identification consists of the township number, north or south; the range number, east or west; and the section number. The section is further subdivided into sixteen 40-acre tracts lettered consecutively (excepting I and O), beginning with A in the northeast corner of the section and progressing in a sinusoidal manner to R in the southeast corner. Wells within the 40-acre tract are numbered sequentially. The base line and meridian are indicated by the final letter, as follows: H, Humboldt; M, Mount Diablo; S, San Bernardino.
Spring number: Springs are numbered similarly. However the letter S is added after the 40-acre tract letter to differentiate the spring from a well.

Owner or user: The apparent owner or user on the date indicated. In some cases, the local name of the well or spring is given.

Ownership:

- C County
- F Federal Government
- M City, town, or unincorporated village
- N Corporation or company, churches, lodges, and other nonprofit, nongovernment groups
- P Private
- S State agency
- W Water district.

Use of water:

- A Air conditioning
- B Bottling
- C Commercial
- D Dewatering
- E Power generation
- F Fire protection
- H Domestic
- I Irrigation
- M Medicinal
- N Industrial, including mining
- P Public supply
- R Recreation
- S Stock supply
- T Institutional
- U Unused
- V Repressurization
- W Recharge
- X Desalination, public supply
- Y Desalination, other use
- Z Other.

Use of well:

- A Anode
- D Drainage
- G Seismic hols
- H Heat reservoir
- O Observation
- P Oil or gas
- R Recharge
- T Test hole
- U Unused
- W Withdraw water
- X Waste disposal
- Z Destroyed.

Well data: In tabulation below, C, complete data; N, no data; P, partial data. Complete physical data include depth, diameter, and finish. Complete geologic data include lithology and aquifer thickness. Complete water-level data include altitude of land-surface datum, in feet above mean sea level; water level, in feet above(+) or below land-surface datum; and date of measurement. Complete yield data include rate of pumping and drawdown.

Code symbol	1	2	3	4	5	6	7	8	9	0
Physical	C	C	P	C	C	P	C	C	P	P
Geologic	C	C	P	C	C	N	C	N	P	N
Water level	C	C	C	N	N	P	P	C	C	N
Yield	C	N	C	C	N	P	C	N	N	P

Chemical analyses:

- C Complete
- G Dissolved gasss
- J Conductance and chloride
- K Conductance
- L Chloride
- M Multiple (complete and one or more partials)
- P Partial
- R Radiochemical (plus partial or comple chemical)
- S Special (tritium, carbon-14, and all other special determinations)
- T Trace elements (spectrographic).

Log data:

- A Drilling-time
- B Casing-collar
- C Caliper (diameter) survey
- D Driller's
- E Electric
- F Fluid-conductivity or fluid-resistivity
- G Geologist or sample
- H Magnetic
- I Induction
- J Gamma-ray
- K Dipmeter or directional (inclinometer) survey
- L Laterolog
- M Microlog
- N Neutron
- O Microlaterolog
- P Photographic
- Q Radioactive-tracer
- R Radiation (includes both neutron and gamma-ray)
- S Sonic
- T Temperature
- U Temperature and fluid-conductivity (resistivity)
- V Fluid-velocity
- W Electric and radiation
- X Electric, radiation, caliper, and fluid-velocity
- Y Electric, radiation, and sample (or driller'
- Z Electric, radiation, temperature, and fluid-conductivity.

Depth of well: Depth, in feet below land-surface datum, as reported by owner, driller, or others, or as measured by the Geological Survey.

Depth cased: Length of casing, in feet below land-surface datum, to the top of the first perforations.

Diameter: Inside diameter of the well, in inches; nominal inside diameter, in inches, of the innermost casing at the surface for drilled cased w

Well finish:

- C Porous concrete
- F Gravel wall, perforated or slotted casing
- G Gravel wall, commercial screen
- H Horizontal gallery or collector
- O Open end
- P Perforated or slotted casing
- S Screen
- T Sand point
- W Walled or shored
- X Open hole in aquifer (generally cased to aquifer)
- Z Other.

Method drilled:

- A Rotary
- B Bored or augered
- C Cable-tool
- D Dug
- H Hydraulic-rotary
- J Jetted
- P Air percussion
- R Reverse-rotary
- T Trenching
- V Driven
- W Drive-wash
- Z Other.

Lift type:

- A Air
- B Bucket
- C Centrifugal
- J Jet
- L Multiple (centrifugal)
- M Multiple (turbine)
- N None
- P Piston
- R Rotary
- S Submergible
- T Turbine
- Z Other.

Power:

1 Hand

2 Natural gas engine
- A 0-20 hp
- B >20-50
- C >50-100
- D>100-200
- E >200

3 Gasoline engine
- F 0-5 hp
- G >5-20
- H >20-50
- J >50-100
- K >100-200
- L >200

4 Diesel engine
- H 0-50 hp
- N >50-150
- P>150-400
- Q>400-750
- R >750

5 Electric motor
- S 0-1 hp
- T >1-5
- U >5-15
- V>15-100
- W >100

6 Wind

7 LP gas engine (propane or butane)
- A 0-20 hp
- B >20-50
- C >50-100
- D>100-200
- E >200

8 Other.

Altitude of lsd: Altitude of land-surface datum, in feet, above mean sea level. Land-surface datum is an arbitrary plane closely approximating land surface at the time of the first measurement and used as the plane of reference for all subsequent measurements.

Water level: Depth to water, in feet, above(+) or below land-surface datum.

Date measured: Month and year of the water-level measurement; other data given generally apply for this date.

Yield of well (or spring): Yield, in gallons per minute; drawdown, in feet.

State well number	Owner or user	Ownership	Use of water	Use of well	Well data	Chemical analyses	Log data	Depth of well (feet below lsd)	Depth cased (feet below lsd)	Diameter (inches)	Well finish	Method drilled	Year drilled	Lift type	Power	Altitude of lsd (feet)	Water level (feet below lsd)	Date measured	Yield of well: Gallons per minute	Yield of well: Drawdown (feet)
18S/42E-22R01M	U.S. GOVERNMENT	F		Z	5		G	62		6	X	H	1953	N		1550		7-67		
19S/41E-04H01M	L. A. CHRISTMAN	P	H	W	8			4		90	D	D		Z	B	3200	FLOW	7-67	2	
19S/41E-16G01M	ANACONDA CO	N	N	W		C			0	12	P			M	T	3580		9-67		
19S/41E-16G02M		P	U	U		C		30		54	W	D		N		3560	28	9-67		
19S/41E-16L01M		P	U	U				28				D		P		3600	26	9-67		
19S/41E-21D01M		P		Z				80		60	W	D		P		3655		9-67		
19S/42E-12C01M				Z			D	157		2		B	1966	N		1542		1-68		
20S/44E-31J01M		P		Z				31		42	X	D		N		1102		9-67		
21S/43E-25C01M		P		Z		C		48		8			1955	N		1120		3-67		
21S/44E-03C01M	J. BARKER	P	H	W				104		6				P	1	1117	60	8-67		
21S/44E-27M01M		P	U	U		C		44		12				N		1082	44	8-67		
21S/44E-33H01M		P	U	U				25		12				N		1060	17	9-67		
22S/42E-05R01M	U.S. NAVY	F		Z				8		84	D	D		N		6156		2-67		
22S/42E-12D01M	JONES & BALCH	P	U	U				7		60	X	D		Z		3400	6	3-67		
22S/42E-12D02M	JONES & BALCH	P	U	U				7			X	D		Z		3400	7	3-67		
22S/44E-03M01M	BALLARAT STORE	P	H	W				300		6				S	K	1065		8-67		
22S/44E-04J01M	R. THOMPSON	P		Z				0						N		1061		9-67		
22S/44E-09R01M	U.S. GOVERNMENT	F	U	U			G	79		6		H		N		1040	11	9-67		
22S/44E-09G01M	U. OF MASS	P	U	U			D	75		2				N		1040	8	8-67		
22S/44E-09G02M	U. OF MASS	P	U	U				33		2				N		1040	8	8-67		
22S/44E-10001M	CAMPBIRD MILL	P		Z		C		3		48		D		N		1020		9-67		
22S/44E-22E01M		P	U	U				28		78	W	D		N		1050	28	9-67		
22S/44E-22E02M		P	U	U				4		24	W	D		N		1040	3	9-67		
22S/45E-11M01M	G. CLAIR	P	H	W						72	W	D		Z		5880	FLOW	9-67	2	
22S/45E-29H01M	HARRY BRIGGS	P	U	U		C		8		36	X	D		N		5800	4	9-67		
23S/42E-17L01M	U.S. NAVY	F	U	U				8		24		D		N		5520	8	2-67		
23S/42E-25M01M	EDWARD KIRK	P	H	W	5	C		42		60	H	D	1957	C	T	3400		3-67		
23S/42E-25Q01M	EDWARD KIRK	P		Z				28		72	W	D		N		3160		3-67		
23S/42E-36C01M	EDWARD KIRK	P		Z				52		60	W	D		N		3240		3-67		
23S/42E-36D01M	JOHN HUSTEAD	P	U	U						8				P		3320		3-67		
23S/42E-36G01M	NORMAN RIGGLES	P	H	W				110		8		C		P	S	3160	95	3-67		
23S/42E-36H01M	OSCAR WALSTROM	P	H	W				110		8		C		P	S	3120	95	3-67		
23S/42E-36J01M	CHUCK CRABTREE	P		Z				96		10	X	C		N		3080		3-67		
23S/43E-28A01M	AP&CC	N	U	U	5	C	D	757	544	12		C	1948	N		2349		1-67		
23S/43E-31C01M	AP&CC	N	U	Z				35		4	H	D	1931	P		2880		1-67		
23S/43E-31D01M	H. F. BISHOP	P	H	W	5	C	D	107	47	4	F	H	1963	S	5	2940	43	3-67		
23S/43E-31D02M	H. F. BISHOP	P	U	U						60	X	D		J	S	2940	31	3-67		
23S/43E-31D03M	MOHAWK MINE	N	U	U				23		72	W	D		P	3	2935	22	3-67		
23S/43E-31D04M	CHARLES BLACK	P	H	W						4		H		S	T	3160		3-67		
23S/43E-31D05M	J. W. KOSTER	P	H	W				50		8		H		J	5	3000		3-67		
23S/43S-31D06M	J. MCPHERSON	P	H	W				40		10	F	D	1947	J	S	3020	25	3-67		
23S/43E-31G01M	AP&CC	N	H	W		P		62		37	H	D	1936	M	T	2850		1-67	20	
23S/43E-32E01M	RAY KAROKER	P	H	W				119				H	1964	P	6	2685		3-67		
23S/43E-33M01M	R. ARCHER	P		Z			D				X	C	1963	N		2480		3-67		
23S/44E-03N01M	U.S. GOVERNMENT	F	U	U		C	G	11		6			1953	N		1040		8-67		
23S/44E-04G01M	U.S. GOVERNMENT	F	U	U		C		586		4				N		1040		8-67		
23S/44E-14R01M		P	U	U				45		66		D		N		1120	43	8-67		
24S/41E-12R01M	U.S. NAVY	F		Z				0		96		D		N		4320		2-67		
24S/43E-07J01M	AP&CC	N		Z		P	D	94		14		C	1931	N		2200		1-67		
24S/43E-07P01M	AP&CC	N	H	W		C	D			6		C	1931	P	G	2450		1-67		
24S/43E-09P01M	AP&CC	N	U	U	2	C	D	600	404	14	P	C	1963	N		2017		1-67		
24S/43E-14L01M	STOCKWELL MINE	P	H	W	5	C	D	436		96	W	D	1963	S	5	1913		2-67		
24S/43E-15K01M			U	U				30		6				N		1900	22	2-67		
24S/43E-16G01M				Z				3		48		D		N		1940		2-67		
24S/43E-20R01M	AP&CC	N		Z				0				D		N		1734		2-67		
24S/43E-21J01M	AP&CC	N	N	W	3	C	D			12		C	1931	M	V	1751		1-67		
24S/43E-21J02M	AP&CC	N		Z	3	C		0						N		1750		1-67		
24S/43E-21J03M	AP&CC	N		Z				0		6				N		1750		1-67		
24S/43E-22G01M	AP&CC	N	N	W	6	C	D			14			1963	M	V	1822		1-67		
24S/43E-22M01M	AP&CC	N	N	W	6	C	D			16	P	C	1937	M	V	1764		1-67		

State well number	Owner or user	Ownership	Use of water	Use of well	Well data	Chemical analyses	Log data	Depth of well (feet below lsd)	Depth cased (feet below lsd)	Diameter (inches)	Well finish	Method drilled	Year drilled	Lift type	Power	Altitude of lsd (feet)	Water level (feet below lsd)	Date measured	Yield of well: Gallons per minute	Yield of well: Drawdown (feet)
24S/43E-22M02M	AP&CC	N	N	W	6	P	D			16	P	C	1943	M	V	1775		1-67		
24S/43E-22N01M	AP&CC	N	N	W	6	C	D			16		C	1950	M	V	1759		1-67		
24S/43E-22N02M	AP&CC	N	U	U	2	P	D			14		C	1939	N		1756		1-67		
24S/43E-22N03M	AP&CC	N		Z	6	P	D	0		14	P	C	1923	N		1756		1-67		
24S/43E-22P01M	AP&CC	N		Z				0				D		N		1776		1-67		
24S/43E-22Q01M	AP&CC	N		Z				0				D		N		1777		1-67		
24S/43E-22Z01M	AP&CC	N		Z				0						N		1761		1-67		
24S/43E-23M01M	AP&CC	N		Z		P		79		72		D		N		1772		1-67		
24S/43E-23N01M	AP&CC	N		Z				0						N		1761		1-67		
24S/43E-28B01M	AP&CC	N		Z				3		60		D	1914	N		1718		1-67		
24S/43E-30P01M				Z				0		6				N		2080		2-67		
24S/43E-31F01M				Z								C		N		2040		2-67		
24S/43E-32L01M	AP&CC	N	U	U	6	P	D			16	P	C	1948	M	V	1702	98	1-67		
24S/43E-32Q01M	E. D. FORD	P	H	W				176		6				S	T	1685	116	8-67		
24S/43E-32Q02M	E. D. FORD	P	U	U			D	72		8		C	1963	N		1685		8-67		
24S/44E-12L01M				Z				40		72	X	D		N		1115		1-67		
24S/45E-06L01M		P	U	U				100		60	X	D		P		1440	100	9-67		
25S/43E-01H01M		P		Z				19		10				N		1680		8-67		
25S/43E-03L01M	S. L. CHEM. CO.	N	U	U		C	D	58		6		H	1912	N		1623	6	8-67		
25S/43E-03P01M	S. L. CHEM. CO.	N	U	U				76		6				N		1621	5	8-67		
25S/43E-09E01M	M. H. MORRIS	P	U	U		C		32		6				N		1625	0	8-67		
25S/43E-09Q01M	AP&CC	N	U	U				22		16				N		1621	3	8-67		
25S/43E-09Q02M	AP&CC	N	U	U				44		4				N		1621	2	8-67		
25S/43E-10B01M	AP&CC	N	U	U			D	89		4				N		1621	5	8-67		
25S/43E-10B02M	AP&CC	N	U	U			D	37		16		H		N		1621	6	8-67		
25S/43E-10G01M	AP&CC	N	U	U			G	87		10		H	1954	N		1621	3	8-67		
25S/43E-11D01M	AP&CC	N	U	U				20		6				N		1622	5	8-67		
25S/43E-11R01M	AP&CC	N	U	U				68		16				N		1622	3	8-67		
25S/43E-11R02M	AP&CC	N	U	U						4				N		1622	3	8-67		
25S/43E-12P01M	USB&CC	N	U	U				39		16		H		N		1623	3	8-67		
25S/43E-13N01M	AP&CC	N	U	U				51		16			1935	N		1616	1	8-67		
25S/43E-13N02M	AP&CC	N	U	U				133		4			1935	N		1616	2	8-67		
25S/43E-13N03M	AP&CC	N	U	U				384		10			1967	N		1616	17	8-67		
25S/43E-13N04M	AP&CC	N	U	U						12		H	1967	N		1616	4	9-67		
25S/43E-15D01M	AP&CC	N	U	U				1		6				N		1621	1	8-67		
25S/43E-15R01M	AP&CC	N	U	U				14		12				N		1619	3	8-67		
25S/43E-15R02M	AP&CC	N	U	U				20		10			1942	N		1619	1	8-67		
25S/43E-16G01M	S. B. BORAX CO.	N	U	U						10				N		1622	2	8-67		
25S/43E-16G02M	S. B. BORAX CO.	N	U	U				44		2				N		1622	3	8-67		
25S/43E-17D01M	AP&CC	N	N	W	1	P	D			16	P	C	1930	M	V	1691		1-67		
25S/43E-17D02M	AP&CC	N	N	W	1	C	D			14	F	H		M	V	1702		1-67		
25S/43E-17D03M	AP&CC	N		Z	1	P	D	0		14	P	C	1926	N		1704		1-67		
25S/43E-17D04M	AP&CC	N	U	U	1	P	D			16		C	1944	N		1705		1-67		
25S/43E-17D05M	AP&CC	N	N	W						14	F		1966	M	V	1718		1-67		
25S/43E-17D06M	AP&CC	N	N	W	1	P	D			14		C	1935	M	V	1700		1-67		
25S/43E-17H01M	AP&CC	N	U	U						6				N		1623	FLOW	8-67		
25S/43E-17R01M	S. B. BORAX CO.	N	U	T				93		12		A		N		1623	2	8-67		
25S/43E-19Q01M		N	U	Z				1		4				N		1620		8-67		
25S/43E-20G01M	S. B. BORAX CO.	N	U	T				67		12				N		1620	2	8-67		
25S/43E-21M01M	AP&CC	P		Z			G	0				C	1896	N		1617		8-67		
25S/43E-21P01M	S. B. BORAX CO.	N	U	U				5		3				N		1617	1	8-67		
25S/43E-21Q01M	AP&CC	N	U	U				128		10				N		1617	1	8-67		
25S/43E-22B01M	AP&CC	N	U	U		C		119		10				N		1616	5	8-67		
25S/43E-22C01M	AP&CC	N	U	U						16	X	H	1967	N		1616	0	8-67		
25S/43E-22C02M	AP&CC	N	U	U						6				N		1616	0	8-67		
25S/43E-22R01M	AP&CC	N	U	U				54		10				N		1616	1	8-67		
25S/43E-23A01M	AP&CC	N	U	U				9		16			1935	N		1616	1	8-67		
25S/43E-23A02M	AP&CC	N	U	U				150		4			1935	N		1616	1	8-67		
25S/43E-23B01M	AP&CC	N	U	U				13		10				N		1616	2	8-67		
25S/43E-23D01M	AP&CC	N	U	U				80		16				N		1616	1	8-67		

State well number	Owner or user	Ownership	Use of water	Use of well	Well data	Chemical analyses	Log data	Depth of well (feet below lsd)	Depth cased (feet below lsd)	Diameter (inches)	Well finish	Method drilled	Year drilled	Lift type	Power	Altitude of lsd (feet)	Water level (feet below lsd)	Date measured	Yield of well: Gallons per minute	Yield of well: Drawdown (feet)
25S/43E-23D02M	AP&CC	N	U	U				149		4				N		1616	3	8-67		
25S/43E-23D03M	AP&CC	N	U	U				134		12				N		1616	3	8-67		
25S/43E-23E01M	AP&CC	N	U	U				135		10			1947	N		1616	5	8-67		
25S/43E-23M01M	AP&CC	N	U	U				17		8				N		1616	2	8-67		
25S/43E-23R01M	AP&CC	N	U	U				77		16				N		1616	1	8-67		
25S/43E-23R02M	AP&CC	N	U	U				67		4				N		1616	3	8-67		
25S/43E-24N01M	AP&CC	N	U	U				148		10				N		1616	1	8-67		
25S/43E-24R01M	STAUFFER CHEM.	N	U	U			G	50		10		H	1954	N		1617	2	8-67		
25S/43E-24R02M	STAUFFER CHEM.	N	U	U			G	100		4		H	1954	N		1617	2	8-67		
24S/43E-27B01M	AP&CC	N	U	U				18		10				N		1616	1	8-67		
25S/43E-27F01M	AP&CC	N	U	U				56		10				N		1616	1	8-67		
25S/43E-31M01M	STAUFFER CHEM.	N	N	W	6		D	154	54	10	F	H	1966	M	V	1680		2-67		
25S/43E-31N01M	STAUFFER CHEM.	N	U	U	6	C	D	108		12			1947	N		1680	82	2-67		
25S/43F-32H01M	S. L. CHEM. CO.	N	U	U			D	52		16		H		N		1618	3	8-67		
25S/43E-32H02M	S. L. CHEM. CO.	N	U	U			D	103		4				N		1618	3	8-67		
25S/43E-32Q01M	S. L. CHEM. CO.	N	U	U			G	57		16			1954	N		1621	3	8-67		
25S/43F-32Q02M	S. L. CHEM. CO.	N	U	U			G	104		4			1954	N		1621	3	8-67		
25S/43E-33A01M	STAUFFER CHEM.	N	U	U				137		10				N		1618	1	8-67		
25S/43E-33A02M	STAUFFER CHEM.	N	U	U				127		4				N		1618	2	8-67		
25S/43E-33F01M	STAUFFER CHEM.	N	U	U			D	37		10				N		1619	3	8-67		
25S/43E-33F02M	STAUFFER CHEM.	N	U	U			D	116		3				N		1619	3	8-67		
25S/43E-33P01M	AP&CC	N	U	U			D	57		16			1954	N		1620	4	8-67		
25S/43E-33P02M	AP&CC	N	U	U			D	101		4			1954	N		1620	4	8-67		
25S/43E-33R01M	AP&CC	N	U	U			G	68		16			1955	N		1620	2	8-67		
25S/43E-33R02M	AP&CC	N	U	U			G			4			1955	N		1620	3	8-67		
25S/43F-34B01M	STAUFFER CHEM.	N	U	U				13		10				N		1617	1	8-67		
25S/43F-34F01M	STAUFFER CHEM.	N	U	U				20		10				N		1617	0	8-67		
25S/43E-34P01M	AP&CC	N	U	U				128		2				N		1619	6	8-67		
25S/43E-34P02M	AP&CC	N	U	U				118		2				N		1619	4	8-67		
25S/43E-34P03M	AP&CC	N	U	U				103		2				N		1619	4	8-67		
25S/43F-34R01M	AP&CC	N	U	U				125		2				N		1619	6	8-67		
25S/43F-34R02M	AP&CC	N	U	U				107		2				N		1619	5	8-67		
25S/43F-34R03M	AP&CC	N	U	U				96		2				N		1619	5	8-67		
25S/43F-35B01M	STAUFFER CHEM.	N	U	U			D	76		10				N		1616	2	8-67		
25S/43F-35R02M	STAUFFER CHEM.	N	U	U			D	77		4				N		1616	3	8-67		
25S/43F-35D01M	STAUFFER CHEM.	N	U	U			D	34		10		H	1955	N		1616	1	8-67		
25S/43F-35D02M	STAUFFER CHEM.	N	U	U			D	123		4		H	1955	N		1616	2	8-67		
25S/43F-36B01M	STAUFFER CHEM.	N	U	U			D	47		10		H	1955	N		1616	2	8-67		
25S/43F-36B02M	STAUFFER CHEM.	N	U	U			D	122		4		H	1955	N		1616	2	8-67		
25S/43E-36D01M	STAUFFER CHEM.	N	U	U			G	18		10		H	1955	N		1616	1	8-67		
25S/43E-36D02M	STAUFFER CHEM.	N	U	U			G	125		4		H	1955	N		1618	3	8-67		
25S/44E-22K01M	U. S. NAVY	F	U	U							H	D		N		2320		1-67		
25S/44E-23L01M	U. S. NAVY	F	U	U		C				48	X	D		N		2960	FLOW	1-67		
25S/44E-23R01M	U. S. NAVY	F	U	U							H	D		N		3400	4	1-67		
25S/44E-24M01M	U. S. NAVY	F	U	U							H	D		N		3480	2	1-67		
25S/44E-30F01M	STAUFFER CHEM.	N	U	U			D	53		10		H	1955	N		1618	2	8-67		
25S/44E-30F02M	STAUFFER CHEM.	N	U	U			D	26		4		H	1955	N		1618	2	8-67		
25S/44E-30N01M	STAUFFER CHEM.	N	U	U			G	70		10		H	1955	N		1618	2	8-67		
25S/44E-30N02M	STAUFFER CHEM.	N	U	U			G	109		4		H	1955	N		1618	2	8-67		
25S/44E-31K01M	AP&CC	N	U	U			G	13		16		H	1955	N		1620	2	8-67		
25S/44E-31K02M	AP&CC	N	U	U			G	104		4		H	1955	N		1620	2	8-67		
25S/44E-32G01M	S. L. CHEM. CO.	N	U	U				47		10				N		1618	4	8-67		
25S/45E-29K01M	U. S. NAVY	F	U	U		C		1		36	X	D		N		3240	0	1-67		
25S/45E-29R01M	U. S. NAVY	F	U	U		C		5		36	X	D		N		3280	4	1-67		
26S/43E-01C01M	AP&CC	N	U	U				2		2				N		1617		8-67		
26S/43E-01C02M	AP&CC	N	U	U				39		2				N		1617	3	8-67		
26S/43E-01C03M	AP&CC	N	U	U				54		2				N		1617	3	8-67		
26S/43E-01C04M	AP&CC	N	U	U				54		2				N		1617	3	8-67		
26S/43E-01G01M	AP&CC	N	U	U				2		2				N		1617		8-67		
26S/43E-01G02M	AP&CC	N	U	U				38		2				N		1617	3	8-67		

State well number	Owner or user	Ownership	Use of water	Use of well	Well data	Chemical analyses	Log data	Depth of well (feet below lsd)	Depth cased (feet below lsd)	Diameter (inches)	Well finish	Method drilled	Year drilled	Lift type	Power	Altitude of lsd (feet)	Water level (feet below lsd)	Date measured	Yield of well: Gallons per minute	Yield of well: Drawdown (feet)
26S/43E-01G03M	AP&CC	N	U	U				52		2				N		1617	3	8-67		
26S/43E-01G04M	AP&CC	N	U	U				52		2				N		1617	3	8-67		
26S/43E-01J01M	AP&CC	N	U	U				74		16				N		1618	2	8-67		
26S/43E-01J02M	AP&CC	N	U	U				152		4				N		1618	3	8-67		
26S/43E-02A01M	AP&CC	N	U	U				134		2				N		1617	5	8-67		
26S/43E-02E01M	AP&CC	N	U	U				77		6				N		1617	4	8-67		
26S/43E-02G01M	AP&CC	N	U	U				19		3				N		1618	4	8-67		
26S/43E-02M01M	AP&CC	N	U	U			G	74		16		H		N		1618	3	8-67		
26S/43E-02M02M	AP&CC	N	U	U			G	111		4		H	1955	N		1618	4	8-67		
26S/43E-02N01M	AP&CC	N	U	U				66		6				N		1619	5	8-67		
26S/43E-03A01M	AP&CC	N	U	U				75		16				N		1619	4	8-67		
26S/43E-03C01M	AP&CC	N	U	U				45		6				N		1619	3	8-67		
26S/43E-04B01M	AP&CC	N	U	U				62		10				N		1920	4	8-67		
26S/43E-04M01M	S. L. CHEM. CO.	N	U	U				105		6				N		1920	4	8-67		
26S/43E-04N01M			U	U				12		6				N		1920	5	8-67		
26S/43E-06F01M	STAUFFER CHEM.	N	N	W						12				M	V	1660		2-67		
26S/43E-06F02M	STAUFFER CHEM.	N	N	W	6		D		82	14			1942	M	V	1660		2-67		
26S/43E-06F03M	STAUFFER CHEM.	N	U	U				98						N		1660	96	2-67		
26S/43E-10N01M	M. H. MORRIS	P	U	U				77		5				N		1630	7	11-66		
26S/43E-11E01M	USBLM	F	U	U				56		6				N		1621	3	8-67		
26S/43E-11N01M	S. L. CHEM. CO.	N	U	U			G	43		16		H	1955	N		1627	6	11-66		
26S/43E-11N02M	S. L. CHEM. CO.	N	U	U			G	72		2		H	1955	N		1627	6	11-66		
26S/43E-13K01M	S. L. CHEM. CO.	N	U	U		C	G	15		16		H	1954	N		1621	4	11-66		
26S/43E-14C01M	S. L. CHEM. CO.	N	U	U				53		4				N		1625	4	11-66		
26S/43E-14D01M	S. L. CHEM. CO.	N	U	U				7		6			1967	N		1628	7	8-67		
26S/43E-14M01M	S. L. CHEM. CO.	N	U	U				33		10		H	1960	N		1629	7	8-67		
26S/43E-15M01M	M. H. MORRIS	P	U	U		C		32		10		H	1967	N		1630	7	8-67		
26S/43E-17D01M	USBLM	F		Z				2		6				N		1645		11-66		
26S/43E-21A01M	W. R. WHITE	P	U	U				26		10		H	1967	N		1633	7	8-67		
26S/43E-22A01M	W. R. WHITE	P	U	U		C		52		6				N		1630	8	8-67		
26S/44E-01F01M	U. S. NAVY	F		Z				12		72		D		N		3000		1-67		
26S/45E-01M01M	U. S. NAVY	F	U	U				2		24	X	D		N		2880	2	11-66		
26S/44E-02Q01M	U. S. NAVY	F	U	U				5		66	W	D		N		2480	4	11-66		
26S/44E-05F01M	S. L. CHEM. CO.	N	U	U				44		16				N		1920	4	8-67		
26S/44E-05F02M	S. L. CHEM. CO.	N	U	U				90		4				N		1920	2	8-67		
26S/44E-05F03M	S. L. CHEM. CO.	N	U	U				3		60				N		1920	3	8-67		
26S/44E-08L01M	S. L. CHEM. CO.	N	U	U				45		16				N		1620	5	8-67		
26S/44E-08L02M	S. L. CHEM. CO.	N	U	U				85		4				N		1620	4	8-67		
26S/44E-17D01M	S. L. CHEM. CO.	N	U	U				47		16				N		1619	4	8-67		
26S/44E-17E01M	S. L. CHEM. CO.	N	U	Z				3		6				N		1620		8-67		
26S/44E-18J01M	S. L. CHEM. CO.	N	U	U				48		16			1954	N		1620	5	8-67		
26S/44E-19J01M	M. J. KALLERUD	P	U	U				11						N		1625	8	8-67		
26S/44E-20D01M	S. L. CHEM. CO.	N	U	U				45		4				N		1621	5	8-67		
26S/45E-07R01M	U. S. NAVY	F		Z				62		84	X	D		N		3325		11-66		
26S/45E-20M01M	U. S. NAVY	F		Z				3		42		D		N		4000		11-66		
26S/45E-20M02M	U. S. NAVY	F		Z				16		72	X	D		N		4000		11-66		
26S/45F-21J01M	U. S. NAVY	F		Z		C		6		48	X	D		N		3040		11-66		
26S/45E-22L01M	U. S. NAVY	F	U	U				8			X	D		Z		2880	3	11-66		
26S/45F-22N01M	U. S. NAVY	F	U	U		C		6	4	42		D		N		3200	4	11-66		
26S/45E-22N02M	U. S. NAVY	F	U	U				30				D		N		3200	30	11-66		
26S/45E-29D01M	U. S. NAVY	F	U	U						180	X	D		P		4220	200	11-66		
27S/42F-24M01M	USBLM	F		Z			D	242		18	X	C	1948	N		1955		11-66		
27S/43E-30Q01M				Z				169		42	X	D		N		1980		11-66		
27S/46F-17C01M	U. S. NAVY	F	U	U				4			X	D		N		2038	3	11-66		
28S/43E-06B01M	MORGAN'S WELL	P		Z		C		0						N		2058		1-67		
28S/43E-12A01M	U. S. NAVY	F	D	W		C	D	485		8	P	H	1952	S	U	2400	315	11-66		
28S/44E-08C01M	U. S. NAVY	F	H	W		C	DF	690		10	F	H	1952	M	V	2375	269	11-66		
28S/47E-07N01M	U. S. NAVY	F	U	U		C		1		42	X	D		N		2760	0	1-67		

SPRINGS

State spring number	Owner or user	Ownership	Use of water	Use of spring	Chemical analyses		Depth of spring (feet below lsd)	Depth cased (feet below lsd)	Diameter (inches)				Lift type	Power	Altitude of lsd (feet)	Water level (feet below lsd)	Date measured	Yield of spring: Gallons per minute	Yield of spring: Drawdown (feet)
18S/41E-36BS1	State Div. of Highways	S	H	W									Z	8	2,360		7-67	0.10	
			H	W									Z	8			5-55	.59	
19S/41E-4HS1	L. A. Christman	P	H	W									Z	8	3,200		7-67	a2	
4HS2	U.S. Government	F	U	U									Z	8	3,200		7-67	.32	
9QS1	Miller spring						2.0								3,520		9-67	0	
19S/42E-31KS1	Defense mine	P	U	U									Z	8	4,000		7-67	b.1	
31LS1	Jack Gunn spring		U	U	C		4.3						Z	8	4,600	2.28	7-67	.04	
31MS1	French Madam spring		U	U	C										5,520		4-56	.07	
20S/42E-6AS1	T. Lang and B. Lane M. E. Franklin	P	H	W	C								Z	8	4,240		7-67	(c)	
																	4-54	.5	
7JS1			H	W									Z	8	4,000		7-67	b.1	
32AS1	Stauffer Chem.	N	N	W									Z	8	4,080		7-67	b2	
20S/44E-10DS1	C. H. Tyler	P	N	W	C								Z	8	3,600		4-54	2	
25PS1	J. Barker Indian Ranch		H	W	C								Z	8	4,450		9-67	b100	
																	6-62	150	
21S/42E-3BS1	West Hills Exploration Co.	N	U	U									N		4,040		7-67	(d)	
25ES1															3,160		8-67	0	
26QS1	Kendrick	P	U	U											3,680		8-62	(d)	
30DS1	U.S. Navy	F	H	W									Z	8	6,480		1-68	b1	
			H	W													2-67	b1	
			H	W													9-61	b1	
35BS1	Kendrick	P		U											3,720		8-67	b.5	
35GS1			U	U											3,640		8-67	a1	
35GS2			U	U											3,640		8-67	(d)	
35GS3			U	U											3,640		8-67	(d)	
35GS4			U	U											3,640		8-67	(d)	
35HS1	Harry Lynn	P	H	W											3,440		8-67	a1.5	
36JS1			U	U											2,800		8-67	.12	
36RS1			U	U											2,980		8-67	0	
21S/44E-10LS1	U.S. Government	F	U	U	C										1,030		8-67	(c)	
																	1915	b1	
20CS1			U	U											1,043		8-67	(c)	
21S/45E-10JS1	Richard Thompson	P	H	W									Z	8	6,500		9-67	6	
11HS1	Richard Thompson	P	H	W									Z	8	6,700		9-67	30	
11LS1	Richard Thompson	P	U	U									Z	8	6,400		9-67	1.5	
17DS1	Limekiln spring	P	U	U											4,000		9-67	b10	
29RS1	McKenry & McKernan	P	H	W									Z	8	4,160		11-66	b5	

See footnotes at end of table.

SPRINGS

State spring number	Owner or user	Ownership	Use of water	Use of spring	Chemical analyses		Depth of spring (feet below lsd)	Depth cased (feet below lsd)	Diameter (inches)				Lift type	Power	Altitude of lsd (feet)	Water level (feet below lsd)	Date measured	Yield of spring: Gallons per minute	Yield of spring: Drawdown (feet)
22S/42E-11AS1			H	W									Z	8	3,520		3-67	0.01	
12DS1	Jones and Balch	P	U	U									Z	8	3,320		3-67	(d)	
12FS1			U	U									Z	8	3,080		3-67	.01	
14DS1	Onyx mine	P	H	W	C								Z	8	3,920		3-67	.48	
14FS1	Onyx mine	P	H	W									Z	8	4,040		3-67	.80	
31AS1	U.S. Navy	F	U	U											5,440		2-67	.12	
22S-44E-1PS1	Jackpot spring		H	W									Z	8	2,360		9-67	4	
12KS1	Willow spring		U	U											2,720		9-67	b3	
12MS1			U	U											2,320		9-67	b2	
22S/45E-11MS1	G. Clair	P	U	U											6,000		9-67	(d)	
29GS1	Colter spring		U	U	C										5,800		9-67	0	
30CS1	Harry Briggs	P	H	W									Z	8	4,560		9-67	.28	
23S/42E-3RS1	U.S. Navy	F													3,807		3-67	b.1	
5ES1	U.S. Navy	F	U	U									Z	8	5,400		2-67	(d)	
10BS1	U.S. Navy	F	U	U											3,960		3-67	b3	
11DS1			U	U											3,800		3-67	b2	
13PS1	AP&CC	N	U	U											4,280		1-67 1917	4 5	
20DS1	U.S. Navy	F	U U	U U	C		3.75						Z	8	5,680	3.55	2-67 8-59	.19 .19	
25QS1	H. F. Bishop	P	H	W	C								Z	8	3,240		3-67 1956	b1.5 b1.5	
	C. E. Kirk	P															10-32	1.9	
26BS1	AP&CC	N	U	U									Z	8	3,840		3-67 6-38	3 2.1	
26CS1	AP&CC	N	U	U									Z	8	3,960		3-67 6-38	1.5 1.9	
26GS1	AP&CC	N	U	U											3,720		3-67	b.01	
31JS1	U.S. Navy	F	U	U											5,475		2-67	.2	
32NS1	U.S. Navy	F	U	U											5,560		2-67	b1	
34AS1	Benko spring Robert Walters	P	H	W	C										3,760		3-67 4-54	5	
23S/43E-18ES1	AP&CC	N	U	U									Z	8	3,800		1-67 1917	b1 7	
18PS1	AP&CC	N	U	U											3,600		2-67 4-21 1917	0 3.5 3	
18QS1	AP&CC	N	U	U											3,400		1-67 1917	2 21	

See footnotes at end of table.

SPRINGS

State spring number	Owner or user	Ownership	Use of water	Use of spring	Chemical analyses		Depth of spring (feet below lsd)	Depth cased (feet below lsd)	Diameter (inches)				Lift type	Power	Altitude of lsd (feet)	Water level (feet below lsd)	Date measured	Yield of spring: Gallons per minute	Yield of spring: Drawdown (feet)
23S/43E-31DS1				Z	C										3,010		3-67		
	Patrick Hilliard																4-54	8	
31ES1	C. Crabtree	P	H	W											2,920		3-67	(c)	
24S/42E-1FS1	AP&CC	N	U	U											3,520		2-67		
2DS1	North Ruth spring	N	U	U									Z	8	3,880		3-67		
2DS2	AP&CC	N	U	U	C								Z	8	4,000		3-67	.35	
																	1963	1	
																	7-55	1	
3AS1	U.S. Navy	F			C										4,120		3-67	b1	
12QS1	AP&CC	N	U	U	C								Z	8	3,400		2-67	.94	
13DS1	AP&CC	N	U	U											3,840		2-67	0	
24FS1	Indian Joe spring	P	U	U											2,680		2-67	(c)	
																	9-17	7	
24FS2	Redwood Box spring	P	U	U											2,620		2-67	4	
																	12-28	3.8	
24LS1	AP&CC	N	U	U											2,600		2-67	.12	
26BS1	AP&CC	N	H	W	C								Z	8	2,680		2-67		
																	1965	2.25	
																	1962	2.25	
																	1956	3.3	
																	1930	>3	
24S/43E-7DS1	AP&CC	N	H	W									Z	8	2,920		2-67	b1	
7MS1	AP&CC	N	U	U	C								Z	8	2,800		2-67	1	
																	1964	19	
																	1961	5.8	
																	12-24	2.7	
7NS1	Austin spring		U	U											2,560		2-67	<.1	
18MS1	Bainter spring		U	U	C								Z	8	2,600		1-67	b.2	
24S/45E-9FS1	D. O. Newman	P	U	U											2,520		9-67	0	
11HS1	Myers Ranch	P	H	W									Z	8	3,360		9-67	>5	
11KS1	J. Barker	P	H	W									Z	8	3,280		9-67	.56	
11KS2	J. Barker	P	H	W									Z	8	3,280		9-67		
11MS1	Sourdough spring		U	U	C										3,200		9-67	.5	
																	4-56	15	
26S/45E-21LS1	U.S. Navy	F	U	U											3,640		11-66	.14	
26S/47E-20QS1	U.S. Navy	F	U	U	C										3,600		1-67	.005	

a. Reported by owner or user.
b. Estimated.
c. Flowing, unable to measure.
d. Seep.

TABLE 2.--*Records of water level*

Letter(s) following water-level measurements:

- A Well being pumped.
- B Well pumped recently.
- C Nearby well being pumped.
- D Nearby well pumped recently.
- E Estimated.
- F Dry.
- G Measurement by outside agency or person.
- H Tape measurement (recorder).
- I Affected by outside influence (wind, atmospheric pressure, ocean tides, railroad trains).
- J Water level below sea level.
- K Measurement from recorder chart.
- M Obstruction in well above water surface.
- N No measurement.
- O Measurement discontinued.
- P Well destroyed.
- Q Flowing.

Plus (+) indicates water level above land surface datum (LSD).

18S/42E-22B1 M. DEPTH 375.0 FT IN 1953 AND 62.0 FT ON JULY 18, 1967. ALTITUDE ABOUT 1,550 FT
HIGHEST WATER LEVEL 125.00 FT BELOW LSD, , 1953.
LOWEST STATIC WATER LEVEL 125.00 FT BELOW LSD, , 1953.
RECORDS AVAILABLE: 1953, 1967.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
1953	125		JULY 18, 1967		F						

19S/41E-16G1 M. DEPTH 40 FT ON MARCH 9, 1955. ALTITUDE ABOUT 3,580 FT.
HIGHEST WATER LEVEL 17.50 FT BELOW LSD, MAR. 9, 1955.
LOWEST STATIC WATER LEVEL 37.30 FT BELOW LSD, JAN. 24, 1957.
RECORDS AVAILABLE: 1955, 1957, 1967.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
MAR. 9, 1955	17.5	G	JAN. 24, 1957	37.3	G	SEP. 22, 1967	20.5	B			

21S/43E-25C1 M. OEPTH 82 FT ON JANUARY 28, 1955 AND 47.2 FT ON MARCH 15, 1967. ALTITUDE ABOU
1,120 FT.
HIGHEST WATER LEVEL 62.00 FT BELOW LSD, JAN. 28, 1955, MAR. 15, 1955.
LOWEST STATIC WATER LEVEL 70.00 FT BELOW LSD, MAR. 31, 1960.
RECORDS AVAILABLE: 1955, 1960-61, 1967.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
JAN. 28, 1955	62	G	MAR. 31, 1960	70	G	APR. 20, 1961	64	G	MAR. 15, 1967		F
MAR. 15	62	G									

21S/44E-27M1 M. DEPTH 44.4 FT ON AUGUST 31, 1967. ALTITUDE ABOUT 1,082 FT.
HIGHEST WATER LEVEL 40.00 FT BELOW LSD, MAR. 31, 1960.
LOWEST STATIC WATER LEVEL 44.11 FT BELOW LSD, AUG. 31, 1967.
RECORDS AVAILABLE: 1960, 1967.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
MAR. 31, 1960	40	G	AUG. 31, 1967	44.11							

22S/44E-4J1 M. DEPTH 20.5 FT ON APRIL 17, 1954 AND 0 FT ON SEPTEMBER 14, 1967. ALTITUDE ABOU
1,061 FT.
HIGHEST WATER LEVEL 18.21 FT BELOW LSD, APR. 17, 1954.
LOWEST STATIC WATER LEVEL 18.21 FT BELOW LSD, APR. 17, 1954.
RECORDS AVAILABLE: 1954, 1967.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
APR. 17, 1954	18.21		SEP. 14, 1967		P						

22S/44E-10D1 M. DEPTH 5.5 FT ON FEBRUARY 10, 1955 AND 3.0 ON SEPTEMBER 12, 1967. ALTITUDE ABOUT 1,020 FT.
HIGHEST WATER LEVEL 3.40 FT BELOW LSD, FEB. 10, 1955.
LOWEST STATIC WATER LEVEL 3.40 FT BELOW LSD, FEB. 10, 1955.
RECORDS AVAILABLE: 1955, 1967.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
FEB. 10, 1955	3.4		SEP. 12, 1967		F						

23S/43E-28A1 M. DEPTH 745 FT IN 1948 AND 740 FT IN DECEMBER 1960. ALTITUDE IS 2,348.8 FT. MEASUREMENTS BY OWNER.
HIGHEST WATER LEVEL 659.80 FT BELOW LSD, SEP. , 1948.
LOWEST STATIC WATER LEVEL 687.80 FT BELOW LSD, SEP. , 1965.
RECORDS AVAILABLE: 1948, 1953, 1960-66.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
SEP. 1948	659.8		DEC. 1960	680.0		DEC. 1962	683.2		MAR. 1965	685.7	
OCT.	666.0		JUNE 1961	681.3		AUG. 1963	683.8		SEP.	687.8	
FEB. 1953	669.0		DEC.	681.7		DEC.	684.3		MAR. 1966	686.7	
OCT.	669.0		JULY 1962	682.4		SEP. 1964	685.4		OCT.	686.7	

23S/43E-31D1 M. DEPTH 107 FT ON NOVEMBER 8, 1963. ALTITUDE ABOUT 2,940 FT.
HIGHEST WATER LEVEL 43.35 FT BELOW LSD, MAR. 21, 1967.
LOWEST STATIC WATER LEVEL 47.00 FT BELOW LSD, NOV. 8, 1963.
RECORDS AVAILABLE: 1963, 1967.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
NOV. 8, 1963	47	G	MAR. 21, 1967	43.35							

23S/44E-3N1 M. DEPTH 285 FT ON APRIL 14, 1953 AND 10.9 FT ON AUGUST 29, 1967. ALTITUDE ABOUT 1,040 FT.
HIGHEST WATER LEVEL 10.80 FT BELOW LSD, SEP. 20, 1967.
LOWEST STATIC WATER LEVEL 12.60 FT BELOW LSD, APR. 14, 1953.
RECORDS AVAILABLE: 1953, 1967.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
APR. 14, 1953	12.60		AUG. 29, 1967		F	SEP. 20, 1967	10.8				

24S/43E-7J1 M. DEPTH 500 FT ON JULY 25, 1931 AND 93.8 FT ON JANUARY 25, 1967. ALTITUDE ABOUT 2,200 FT.
HIGHEST WATER LEVEL 90.00 FT BELOW LSD, JULY 25, 1931.
LOWEST STATIC WATER LEVEL 90.00 FT BELOW LSD, JULY 25, 1931.
RECORDS AVAILABLE: 1931, 1967.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
JULY 25, 1931	90	G	JAN. 25, 1967		F						

24S/43E-7P1 M. DEPTH 325 FT ON APRIL 25, 1931. ALTITUDE ABOUT 2,450 FT.
HIGHEST WATER LEVEL 112.00 FT BELOW LSD, APR. 25, 1931.
LOWEST STATIC WATER LEVEL 112.00 FT BELOW LSD, APR. 25, 1931.
RECORDS AVAILABLE: 1931.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
APR. 25, 1931	112	G									

24S/43E-9P1 M. DEPTH 600 FT ON JULY 20, 1963. ALTITUDE IS 2,017.1 FT.
HIGHEST WATER LEVEL 393.30 FT BELOW LSD, JULY 26, 1963.
LOWEST STATIC WATER LEVEL 393.30 FT BELOW LSD, JULY 26, 1963.
RECORDS AVAILABLE: 1963.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
JULY 26, 1963	393.3	G									

24S/43E-14L1 M. DEPTH 280 FT IN 1918, 312 FT ON MARCH 15, 1954 AND 436 FT ON MARCH 9, 1963. ALTITUDE ABOUT 1,913 FT.
HIGHEST WATER LEVEL 243.00 FT BELOW LSD, , 1927.
LOWEST STATIC WATER LEVEL 306.00 FT BELOW LSD, MAR. 15, 1954.
RECORDS AVAILABLE: 1927, 1954, 1963-63.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
1927	243	G	MAR. 15, 1954	306	G	MAR. 9, 1963	280	G			

24S/43E-20R1 M. DEPTH 69.6 FT IN 1917 AND 0 FT ON FEBRUARY 8, 1967. ALTITUDE IS 1,733.9 FT.
HIGHEST WATER LEVEL 69.60 FT BELOW LSD, , 1917.
LOWEST STATIC WATER LEVEL 69.60 FT BELOW LSD, , 1917.
RECORDS AVAILABLE: 1917, 1967.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
1917	69.6		FEB. 8, 1967		P						

24S/43E-21J1 M. DEPTH 300 FT ON FEBRUARY 3, 1931, 233 FT IN JULY 1960, 235 FT IN APRIL 1962, AND 236 FT IN AUGUST 1962. ALTITUDE IS 1,751.4 FT. MEASUREMENTS BY OWNER EXCEPT AS INDICATED.
HIGHEST WATER LEVEL 95.00 FT BELOW LSD, FEB. 3, 1931.
LOWEST STATIC WATER LEVEL 160.30 FT BELOW LSD, DEC. , 1963.
RECORDS AVAILABLE: 1931, 1950, 1953, 1956, 1961-63.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
FEB. 3, 1931	95	G	JUNE 5, 1956	137.5	G	MAR. 1962	152.6		JAN. 1963	157.8	
FEB. 20, 1950	136.3	G	JULY	145.4		JUNE	157.4		AUG.	160.0	
JAN. 22, 1953	137.0	G	JAN. 1961	153.5		AUG.	158.6		DEC.	160.3	
JUNE 3	137.5	G	DEC.	156.9							

24S/43E-21J2 M. DEPTH 300 FT ON MAY 13, 1917 AND 0 FT JANUARY 24, 1967. ALTITUDE IS 1,749.6 FT.
HIGHEST WATER LEVEL 85.20 FT BELOW LSD, MAY 13, 1917.
LOWEST STATIC WATER LEVEL 85.20 FT BELOW LSD, MAY 13, 1917.
RECORDS AVAILABLE: 1917, 1967.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
MAY 13, 1917	85.2		JAN. 24, 1967		P						

24S/43E-22G1 M. DEPTH 400 FT ON SEPTEMBER 4, 1963, 393.0 FT IN SEPTEMBER 1963, 383.5 FT IN AUGUST 1965, AND 381.8 FT IN DECEMBER 1965. ALTITUDE IS 1,822.2 FT. MEASUREMENTS BY OWNER EXCEPT AS INDICATED.
HIGHEST WATER LEVEL 194.60 FT BELOW LSD, SEP. , 1963.
LOWEST STATIC WATER LEVEL 204.80 FT BELOW LSD, OCT. , 1966.
RECORDS AVAILABLE: 1963, 1965-66.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
SEP. 4, 1963	197	G	SEP. 1965	200.0		DEC. 1965	199.6		OCT. 1966	204.8	
SEP.	194.6										

24S/43E-22M1 M. DEPTH 351 FT ON MAY 27, 1937, 297 FT ON OCTOBER 20, 1945, 289.0 FT IN JANUARY 955, 277.0 FT IN MAY 1961, 274.0 IN APRIL 1962, AND 268.0 FT IN MARCH 1964. ALTITUDE IS 1,763.8 T. MEASUREMENTS BY OWNER EXCEPT AS INDICATED.
IGHEST WATER LEVEL 117.00 FT BELOW LSD, MAY 27, 1937.
OWEST STATIC WATER LEVEL 175.20 FT BELOW LSD, DEC. , 1963.
ECORDS AVAILABLE: 1937, 1945, 1955, 1961-63.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL
MAY 27, 1937	117	G	JULY 1961	171.7		MAR. 14, 1962	214	A	AUG. 1963	174.6
OCT. 20, 1945	137		JAN. 1962	172.3		JUNE	173.0		DEC.	175.2
JAN. 1955	170.6									

24S/43E-22M2 M. DEPTH 348 FT IN DECEMBER 1943, 282.6 FT IN JULY 1960, AND 284.6 FT IN JANUARY 966. ALTITUDE IS 1,774.6 FT.
IGHEST WATER LEVEL 162.50 FT BELOW LSD, , 1953.
OWEST STATIC WATER LEVEL 186.30 FT BELOW LSD, DEC. , 1963.
ECORDS AVAILABLE: 1953, 1961-63.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
1953	162.5	JULY 1961	181.9	AUG. 1963	185.8	DEC. 1963	186.3
JAN. 1961	179.3	JULY 1962	182.4				

24S/43E-22N1 M. DEPTH 361 FT ON OCTOBER 5, 1950, 366.8 FT IN APRIL 1951, 264.8 FT IN JUNE 961, 262.8 FT IN APRIL 1962, AND 259.8 FT IN APRIL 1963. ALTITUDE IS 1,758.8 FT. MEASUREMENTS BY WNER EXCEPT AS INDICATED.
IGHEST WATER LEVEL 133.80 FT BELOW LSD, APR. , 1951.
OWEST STATIC WATER LEVEL 166.30 FT BELOW LSD, DEC. , 1963.
ECORDS AVAILABLE: 1950-51, 1960-63.

DATE	WATER LEVEL		DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT. 6, 1950	133.9	G	JULY 1961	161.6	APR. 1962	162.5	AUG. 1963	165.1
APR. 1951	133.8		JAN. 1962	162.3	JULY	163.8	DEC.	166.3
DEC. 1960	159.3							

24S/43E-22N2 M. DEPTH 304 FT ON OCTOBER 5, 1939. ALTITUDE ABOUT 1,756 FT.
IGHEST WATER LEVEL 107.00 FT BELOW LSD, OCT. 5, 1939.
OWEST STATIC WATER LEVEL 107.00 FT BELOW LSD, OCT. 5, 1939.
ECORDS AVAILABLE: 1939.

DATE	WATER LEVEL		DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT. 5, 1939	107	G						

24S/43E-22N3 M. DEPTH 300 FT ON NOVEMBER 14, 1923 AND 0 FT ON JANUARY 24, 1967. ALTITUDE IS ,755.7 FT.
IGHEST WATER LEVEL 90.00 FT BELOW LSD, NOV. 14, 1923.
OWEST STATIC WATER LEVEL 94.16 FT BELOW LSD, DEC. 12, 1934.
ECORDS AVAILABLE: 1923, 1934, 1967.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL
NOV. 14, 1923	90	G	DEC. 12, 1934	94.16	G	JAN. 24, 1967		P		

24S/43E-22P1 M. DEPTH 115.0 FT IN 1917 AND 0 FT ON JANUARY 26, 1967. ALTITUDE IS 1,776.0 FT.
IGHEST WATER LEVEL 115.00 FT BELOW LSD, , 1917.
OWEST STATIC WATER LEVEL 115.00 FT BELOW LSD, , 1917.
ECORDS AVAILABLE: 1917, 1967.

DATE	WATER LEVEL		DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
1917	115.0		JAN. 26, 1967		P			

24S/43E-22Q1 M. DEPTH 107.0 FT IN 1917 AND 0 FT ON JANUARY 26, 1967. ALTITUDE IS 1,776.8 FT.
HIGHEST WATER LEVEL 107.00 FT BELOW LSD, , 1917.
LOWEST STATIC WATER LEVEL 107.00 FT BELOW LSD, , 1917.
RECORDS AVAILABLE: 1917, 1967.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
1917	107.0	JAN. 26, 1967	P				

24S/43E-22Z1 M. DEPTH 96.5 FT IN 1917 AND 0 FT ON JANUARY 24, 1967. ALTITUDE IS 1,761.4 FT.
HIGHEST WATER LEVEL 96.50 FT BELOW LSD, , 1917.
LOWEST STATIC WATER LEVEL 96.50 FT BELOW LSD, , 1917.
RECORDS AVAILABLE: 1917, 1967.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
1917	96.5	JAN. 24, 1967	P				

24S/43E-23M1 M. DEPTH 300 FT ON APRIL 11, 1917 AND 78.9 FT ON JANUARY 26, 1967. ALTITUDE IS 1,772.0 FT.
HIGHEST WATER LEVEL 104.00 FT BELOW LSD, APR. 11, 1917.
LOWEST STATIC WATER LEVEL 104.00 FT BELOW LSD, APR. 11, 1917.
RECORDS AVAILABLE: 1917, 1967.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
APR. 11, 1917	104.0	JAN. 26, 1967	P				

24S/43E-23N1 M. DEPTH 96.8 FT ON APRIL 11, 1917 AND 0 FT ON JANUARY 26, 1967. ALTITUDE IS 1,761.4 FT.
HIGHEST WATER LEVEL 96.80 FT BELOW LSD, APR. 11, 1917.
LOWEST STATIC WATER LEVEL 96.80 FT BELOW LSD, APR. 11, 1917.
RECORDS AVAILABLE: 1917, 1967.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
APR. 11, 1917	96.8	JAN. 26, 1967	P				

24S/43E-28B1 M. DEPTH 65 FT IN 1914 AND 3.0 FT ON JANUARY 26, 1967. ALTITUDE IS 1,718.1 FT.
HIGHEST WATER LEVEL 56.70 FT BELOW LSD, , 1917.
LOWEST STATIC WATER LEVEL 65.00 FT BELOW LSD, , 1927.
RECORDS AVAILABLE: 1917, 1927, 1944-44.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
1917	56.7	1927	65 G	APR. 5, 1944	P		

24S/43E-32L1 M. DEPTH 138.1 FT IN MARCH 1948, 125.1 FT IN NOVEMBER 1960, AND 130.1 FT IN DECEMBER 1960. ALTITUDE IS 1,702.1 FT. MEASUREMENTS BY OWNER EXCEPT AS INDICATED.
HIGHEST WATER LEVEL 66.50 FT BELOW LSD, MAY , 1948.
LOWEST STATIC WATER LEVEL 98.10 FT BELOW LSD, JAN. 24, 1967.
RECORDS AVAILABLE: 1948, 1950, 1960-67.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAY 1948	66.5	JULY 1961	90.4	SEP. 1963	92.8	SEP. 1965	96.0
DEC. 1950	72.5	DEC.	90.2	DEC.	93.1	MAR. 1966	96.8
NOV. 1960	89.7	JULY 1962	90.8	SEP. 1964	94.5	OCT.	98.0
DEC.	89.4	DEC.	91.5	MAR. 1965	95.2	JAN. 24, 1967	98.10

24S/43E-32Q2 M. DEPTH 76 FT ON MARCH 10, 1963 AND 72.4 FT ON AUGUST 28, 1967. ALTITUDE ABOUT 1,685 FT.
HIGHEST WATER LEVEL 66.00 FT BELOW LSD, MAR. 10, 1963.
LOWEST STATIC WATER LEVEL 66.00 FT BELOW LSD, MAR. 10, 1963.
RECORDS AVAILABLE: 1963, 1967.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR. 10, 1963	66	AUG. 28, 1967	F				

25S/43E-3L1 M. DEPTH 154 FT ON MAY 5, 1912, 70.0 FT ON SEPTEMBER 28, 1935, AND 57.6 FT ON AUGUST 8, 1967. ALTITUDE IS 1,622.8 FT. MEASUREMENTS BY OWNER EXCEPT AS INDICATED.
HIGHEST WATER LEVEL 4.90 FT ABOVE LSD, JAN. 14, 1915.
LOWEST STATIC WATER LEVEL 7.10 FT BELOW LSD, MAR. , 1965.
RECORDS AVAILABLE: 1915, 1960-67.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN. 14, 1915 +	4.9	JULY 1962	5.9	SEP. 1964	6.4	MAR. 1966	6.1
DEC. 22, 1960	5.5	JAN. 1963	6.0	MAR. 1965	7.1	OCT.	6.4
JUNE 1961	6.4	MAY	6.1	SEP.	6.8	AUG. 8, 1967	6.43G
DEC.	6.1	DEC.	5.7				

25S/43E-13N3 M. DEPTH 505 FT ON APRIL 8, 1967 AND 383.6 FT ON AUGUST 15, 1967. ALTITUDE ABOUT 1,616 FT.
HIGHEST WATER LEVEL 15.94 FT BELOW LSD, SEP. 23, 1967.
LOWEST STATIC WATER LEVEL 16.63 FT BELOW LSD, AUG. 15, 1967.
RECORDS AVAILABLE: 1967.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
AUG. 15, 1967	16.63	SEP. 23, 1967	15.94				

25S/43E-17D1 M. DEPTH 292 FT ON DECEMBER 19, 1930, 265.1 FT IN AUGUST 1950, AND 263.1 FT IN NOVEMBER 1962. ALTITUDE IS 1,691.1 FT. MEASUREMENTS BY OWNER.
HIGHEST WATER LEVEL 110.10 FT BELOW LSD, DEC. , 1960.
LOWEST STATIC WATER LEVEL 131.00 FT BELOW LSD, SEP. , 1966.
RECORDS AVAILABLE: 1960-62, 1966-66.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC. 1960	110.1	DEC. 1961	114.7	NOV. 1962	126.4	SEP. 1966	131.0
JUNE 1961	111.5	SEP. 1962	124.9				

25S/43E-17D2 M. DEPTH 326 FT IN MAY 1955, 321.5 FT IN DECEMBER 1959, AND 321.5 FT IN FEBRUARY 1962. ALTITUDE IS 1,702.5 FT. MEASUREMENTS BY OWNER.
HIGHEST WATER LEVEL 115.70 FT BELOW LSD, DEC. , 1960.
LOWEST STATIC WATER LEVEL 130.00 FT BELOW LSD, SEP. , 1962, JUNE , 1963.
RECORDS AVAILABLE: 1955, 1959-63.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAY 1955	120.0	MAY 1961	118.0	FEB. 1962	121.4	SEP. 1962	130.0
DEC. 1959	117.0	DEC.	122.5	MAR. 14	126 A	JUNE 1963	130
DEC. 1960	115.7						

25S/43E-17D3 M. DRILLED TO 341 FT AND CASED TO 325 FT ON MAY 10, 1926, AND 0 FT ON JANUARY 24, 1967. ALTITUDE IS 1,704.0 FT.
HIGHEST WATER LEVEL 58.00 FT BELOW LSD, MAY 10, 1926.
LOWEST STATIC WATER LEVEL 58.00 FT BELOW LSD, MAY 10, 1926.
RECORDS AVAILABLE: 1926, 1967.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
MAY 10, 1926	58	G	JAN. 24, 1967		P						

25S/43E-17D4 M. DRILLED TO 241 FT AND CASED TO 203 FT IN SEPTEMBER 1944, AND 208.8 FT ON FEBRUARY 5, 1954. ALTITUDE ABOUT 1,705 FT.
HIGHEST WATER LEVEL 83.00 FT BELOW LSD, SEP. , 1944.
LOWEST STATIC WATER LEVEL 125.50 FT BELOW LSD, FEB. 5, 1954.
RECORDS AVAILABLE: 1944, 1954-54.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
SEP. 1944	83	G	FEB. 5, 1954	125.5	G						

25S/43E-17D6 M. DEPTH 301 FT ON NOVEMBER 14, 1935, 229.1 FT IN DECEMBER 1956, AND 221.1 FT IN FEBRUARY 1966. ALTITUDE IS 1,700.3 FT. MEASUREMENTS BY OWNER.
HIGHEST WATER LEVEL 117.80 FT BELOW LSD, DEC. , 1956.
LOWEST STATIC WATER LEVEL 141.50 FT BELOW LSD, DEC. , 1963.
RECORDS AVAILABLE: 1956, 1961-63, 1966-66.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC. 1956	117.8	JULY 1961	126.1	SEP. 1962	135.3	OCT. 1966	141.4
JAN. 1961	123.0	JAN. 1962	129.6	DEC. 1963	141.5		

25S/43E-22C1 M. DRILLED TO 504 FT AND CASED TO 150 FT ON JULY 5, 1967. ALTITUDE ABOUT 1,616 FT.
HIGHEST WATER LEVEL 2.19 FT BELOW LSD, AUG. 15, 1967.
LOWEST STATIC WATER LEVEL 6.36 FT BELOW LSD, SEP. 23, 1967.
RECORDS AVAILABLE: 1967.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
AUG. 15, 1967	2.19	SEP. 23, 1967	6.36				

25S/43E-31M1 M. ALTITUDE ABOUT 1,680 FT.
HIGHEST WATER LEVEL 95.00 FT BELOW LSD, MAR. 22, 1966.
LOWEST STATIC WATER LEVEL 95.00 FT BELOW LSD, MAR. 22, 1966.
RECORDS AVAILABLE: 1966-66.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
MAR. 22, 1966	95	G									

25S/43E-31N1 M. DEPTH 108 FT ON AUGUST 14, 1947. ALTITUDE ABOUT 1,680 FT.
HIGHEST WATER LEVEL 73.16 FT BELOW LSD, MAR. 19, 1959.
LOWEST STATIC WATER LEVEL 81.63 FT BELOW LSD, FEB. 6, 1967.
RECORDS AVAILABLE: 1959, 1967.

DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL		DATE	WATER LEVEL	
MAR. 19, 1959	73.16	G	MAR. 19, 1959	82.75	A	FEB. 6, 1967	81.63				

26S/43E-6F1 M. DEPTH 200 FT ON MARCH 3, 1937. ALTITUDE ABOUT 1,660 FT.
HIGHEST WATER LEVEL 72.00 FT BELOW LSD, MAR. 3, 1937.
LOWEST STATIC WATER LEVEL 103.1B FT BELOW LSD, MAR. 19, 1959.
RECORDS AVAILABLE: 1937, 1959-59.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR. 3, 1937	72 G	MAR. 3, 1937	97.58A	MAR. 19, 1959	103.18G	MAR. 19, 1959	129.51A

26S/43E-6F2 M. DEPTH 204 FT ON JUNE 2, 1942. ALTITUDE ABOUT 1,660 FT.
HIGHEST WATER LEVEL 76.00 FT BELOW LSD, JUNE 2, 1942.
LOWEST STATIC WATER LEVEL 111.00 FT BELOW LSD, MAR. 19, 1959.
RECORDS AVAILABLE: 1942, 1959-59.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JUNE 2, 1942	76 G	JUNE 2, 1942	117 A	MAR. 19, 1959	111 G	MAR. 19, 1959	141.6 A

26S/43E-13K1 M. DEPTH 31.0 FT ON NOVEMBER 29, 1954 AND 16.8 FT ON NOVEMBER 16, 1966. ALTITUDE ABOUT 1,621 FT.
HIGHEST WATER LEVEL 3.67 FT BELOW LSD, FEB. 18, 1955.
LOWEST STATIC WATER LEVEL 4.33 FT BELOW LSD, NOV. 16, 1966.
RECORDS AVAILABLE: 1955, 1966-66.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
FEB. 18, 1955	3.67G	NOV. 16, 1966	4.33				

28S/43E-6B1 M. DEPTH 430 FT ON JULY 10, 1950 AND 0 FT ON JANUARY 9, 1967. ALTITUDE ABOUT 2,058 FT.
HIGHEST WATER LEVEL 371.00 FT BELOW LSD, JULY 10, 1950.
LOWEST STATIC WATER LEVEL 371.00 FT BELOW LSD, JULY 10, 1950.
RECORDS AVAILABLE: 1950, 1967.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JULY 10, 1950	371 G	JAN. 9, 1967	P				

28S/43E-12A1 M. DEPTH 498 FT IN 1950 AND 485 FT ON OCTOBER 7, 1952. ALTITUDE ABOUT 2,400 FT.
HIGHEST WATER LEVEL 276.00 FT BELOW LSD, DEC. 7, 1950.
LOWEST STATIC WATER LEVEL 328.50 FT BELOW LSD, OCT. 7, 1952.
RECORDS AVAILABLE: 1950, 1952-53, 1961, 1966-66.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC. 7, 1950	276	OCT. 7, 1952	328.5	JULY 24, 1961	310.70	NOV. 27, 1966	322.30
JULY 14, 1952	357.2 B	FEB. 17, 1953	325.9				

28S/44E-8C1 M. DEPTH 690 FT WHEN DRILLED. ALTITUDE ABOUT 2,375 FT.
HIGHEST WATER LEVEL 239.70 FT BELOW LSD, FEB. 17, 1953.
LOWEST STATIC WATER LEVEL 269.22 FT BELOW LSD, NOV. 27, 1966.
RECORDS AVAILABLE: 1953, 1966-66.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN. 9, 1953	247.5 G	FEB. 17, 1953	239.7	MAR. 6, 1953	242.3	NOV. 27, 1966	269.22

TABLE 3.--*Drillers' logs*

The depth given in this table is the depth reported by the driller and is not necessarily the developed depth of the well. The depth given in tables 1 and 2 is a measured or reported depth on the date indicated.

	Thickness (feet)	Depth (feet)
18S/42E-22B1. U.S. Geological Survey hole 2. Altitude about 1,550 ft.		
No core; probably all sand, coarse to fine	10.0	10.0
No core; probably sand to silt	7.0	17.0
Sand to silt; greenish-yellow, massive. Sand grains of quartz (about 90 percent of sand), feldspar, biotite (euhedral, bleached to a golden color), iron oxide-coated quartz, possibly some pyroxene and hornblende. Calcareous	2.8	19.8
Clay, fragments of rounded feldspar crystals, and euhedral biotite; yellowish-gray; massive. Streaks (1 mm average width) of hematite generally parallel to bedding but some are perpendicular. Spots of black flakes (may be iron or manganese oxides). Irregular patches (up to 1 in. long) of brown stains, darker than hematite stains	1.7	21.5
Sand, coarse to fine, pale-greenish-yellow. Subangular quartz and feldspar, about 5 percent mica; streaks of reddish iron oxide. Calcareous	.4	21.9
Clay, yellowish-gray. Scattered flakes of biotite, some zones of iron oxide. A few stringers of coarse sand. Calcareous. Massive	.5	22.4
Sand, similar to sand at depth of 21.9 ft	.3	22.7
Clay containing about 5 percent quartz- and feldspar-sand fragments, yellowish-gray, massive, calcareous	.5	23.2
Sand, medium, yellowish-gray, well-sorted, subangular; about 10 percent biotite flakes; calcareous	.5	23.7
Clay; contains about 1 percent subangular fragments of fine to coarse sand; pale-greenish-yellow; much biotite, generally euhedral; calcareous	3.1	26.8
No record	3.2	30.0
Core destroyed while being removed from core barrel; sludge fragments indicate most of core was clay, yellowish-gray, with fragments of coarse sand forming about 5 percent of total. Some layers of coarse to very coarse sand	8.0	38.0
Sand, fine to very fine, yellowish-gray, massive, well-sorted. Many biotite flakes up to 1 mm diameter. Very calcareous	2.7	40.7
Pebble gravel, light-greenish-gray. Matrix of clay. Fragments are of large crystals(?) of feldspar and quartz, and fine-grained volcanic(?) rock. Ratio of pebbles to matrix is 1 to 3. Calcareous	.5	41.2
Silt, some beds of fine to very fine sand; yellowish-gray. Sand beds up to 2 in. thick	3.6	44.8
No core; probably fine sand, pebbly sand, and some clay	5.2	50.0

	Thickness (feet)	Depth (feet)
18S/42E-22B1--Continued		
Granule and clay mixture, yellowish-gray. Granules up to 3 mm in diameter, subrounded to subangular, composed of basalt and individual minerals	1.6	51.6
Sand, very fine, light-greenish-gray. Contains larger fragments of quartzite and limonite(?). Massive. Calcareous	.2	51.8
No core; cuttings indicate much clay	8.2	60.0
Silt to clay, pale-greenish-yellow. Contains some subangular fragments of dolomite(?) and some small flakes of biotite	1.8	61.8
Clay, pale-greenish-yellow. Contains a 1-in. rounded fragment of vesicular volcanic rock	.2	62.0
Sand, fine to medium, some fragments of very coarse grained sand; pale-olive. Fragments about 97 percent feldspar and quartz(?); some biotite, olivine, iron oxide, and rock fragments. Slightly bedded. Calcareous	3.0	65.0
No core; drilled as if sand	5.0	70.0
Sand and clay intermixed, pale-olive. Sand similar to sand at 65.0 ft. Contains rounded fragments of dolomite, intrusive rock, and volcanic rock up to 10 mm in diameter. Average size about 5 mm. Poor core	2.4	72.4
No core; drilled as if loose sand	7.6	80.0
Clay, contains fragments up to 1 mm long of feldspar and biotite; pale-olive. Bottom 2 in. is coarse sand, mainly feldspar	.7	80.7
No core. Drilled as if sand and clay interbedded; interval between 84 and 86 ft mostly clay	9.3	90.0
Clay, pale-greenish-yellow, massive, homogeneous; core breaks with conchoidal fracture. Contains fragments of biotite up to 0.5 mm in diameter, some feldspar(?)	7.6	97.6
Sand, coarse to very fine, pale-olive, massive. Fragments angular to subangular, many are crystal shaped. Approximate composition: 90 percent feldspar, 6 percent quartz, 3 percent biotite, 1 percent iron oxide, pyroxene(?), amphibole(?). Entire section is very calcareous	14.1	111.7
Clay, pale-greenish-yellow. Lower half shows fine bedding (1 to 5 mm thick); upper half shows no bedding. Breaks with a conchoidal fracture. Clay contains 1 mm biotite fragments, some pyroxene(?), hornblende(?), and feldspar. Very calcareous	2.8	114.5
Sand, very coarse, white, well-sorted. Contains fragments of biotite and quartz(?), possible gypsum. Noncalcareous	.3	114.8

	Thickness (feet)	Depth (feet)
18S/42E-22B1--Continued		
Clay, greenish-yellow; conchoidal fracture. Contains biotite flakes, some iron-oxide stains	3.0	117.8
No core	2.2	120.0
Clay, greenish-yellow; conchoidal fracture. Contains flakes of biotite	12.4	132.4
No core	2.6	135.0
Clay and silt breccia; pale-greenish-yellow clay fragments in matrix of light-brown silt. Fragments are angular, range in width up to diameter of core (2 in.). Ratio of fragments to matrix is about 2 to 1	23.2	158.2
Silt and clay, yellowish-gray, massive, calcareous. Very few biotite flakes. Contains moderate orange-pink stringers of silt, similar to the matrix in the unit above	4.3	162.5
Silt and clay, white to grayish-orange. Contains fragments of feldspar and biotite	5.0	167.5
Marl, pinkish-gray. From 50 to 90 percent calcite, average about 70. Contains fragments of feldspar and biotite	7.5	175.0
Silt and clay; very pale orange grading downward to grayish-orange; massive; calcareous	5.0	180.0
Silt and clay, generally very pale orange; stringers of moderate orange-pink silt; massive; calcareous. At 182.3 ft a 1-in. fragment of vein quartz and smaller pebbles of volcanic rock were found	4.0	184.0
Silt and clay, some beds of fine to medium sand; grayish-orange. Well-bedded; sand beds up to 2 in. thick, finer sediments laminar. Sand fragments largely quartz and feldspar, with some biotite (bleached), iron oxides, and pyroxene(?). Calcareous	6.0	190.0
Marl, mottled white and very pale orange. Mainly $CaCO_3$ with irregular patches of silt. Ratio of carbonate to silt is generally about 2 to 1; some zones about 98 percent carbonate. Transition to unit above is gradational	10.0	200.0
Clay and a little silt, pale-greenish-yellow, massive. Irregular patches and vertical "dikes" of iron oxide stains. Visible minerals: biotite, pyroxene(?), feldspar, iron oxides, possible some iddingsite after olivine. Transition to unit above is gradational over about 2 in.	8.2	208.2
Clay and a little silt, pale-grayish-orange. Vertical streaks of light-brown finer clay	9.5	217.7

	Thickness (feet)	Depth (feet)
18S/42E-22B1--Continued		
Gravel, pale-grayish-orange. Matrix of fine to medium sand; fragments of subangular to subrounded pebbles (2 to 15 mm; average size about 5 mm) of volcanic rock (andesitic and basaltic; pumiceous) and limestone (dusky blue and medium gray)----------	2.1	219.8
Clay and a little silt, yellowish-gray. Vertical streaks of light-brown finer clay----------	6.0	225.8
Sand, fine to medium, pale-grayish-orange----------	1.6	227.4
Clay, silt, and fine sand, pale-grayish-orange----------	2.6	230.0
Gravel, pale-grayish-orange. Matrix is fine to medium sand; fragments of volcanic rock and limestone have a maximum diameter of about 5 mm----------	10.0	240.0
No core; sludge cuttings indicate gravel only----------	10.0	250.0
No core; gravel(?)----------	10.0	260.0
No core; solid-bit drill used----------	5.0	265.0
Silt and clay, yellowish-gray, massive. Some subangular fragments of limestone, 2 to 10 mm in diameter----------	5.0	270.0
Silt, pale-grayish-orange, massive. A very few pebbles scattered throughout. Calcareous. Some darker streaks (carbon?)----------	6.0	276.0
Silt, pebbly, pale-grayish-orange. Pebbles between 2 and 15 mm wide, averaging about 5 mm; composed of volcanic rock (cinder basaltic rock and limestone). Ratio of pebbles to silt is about 1 to 10----------	1.0	277.0
Sand, very fine, and silt; pale-orange; very well sorted. Fine bedding averaging about 1 mm between bedding planes; bottom 6 in. is crossbedded, as if windblown-----	2.0	279.0
Gravel, pale-orange. Pebbles form about 80 percent of the unit; rounded to subrounded, between 2 and 20 mm wide, averaging ahout 8 mm; consist of basaltic rock, cinder, and quartzite(?)----------	.4	279.4
Clay and silt, pale-orange, well-sorted. At 281.3 ft and 282.0 ft there are well-cemented 2 in. beds of very coarse sand fragments in a matrix of solid calcite and silt; sand consists of angular fragments of feldspar, quartz, amphibole, pyroxene, hematite, and volcanic rock-	3.2	282.6
Sand, fine to very fine, light-brownish-gray, massive. Contains a few pebbles of andesitic rock, cinder, and dolomite; round to subround; up to 20 mm long----------	7.4	290.0
No core; drilled as if gravel----------	66.0	356.0
Clay, very pale orange, massive----------	3.2	359.2
Clay, grayish-orange----------	.3	359.5
Sand, fine, grading into coarse sand at base; grayish-orange. Contains pebbles of limestone ranging in size from 2 to 10 mm, averaging about 5 mm; subangular--------	5.5	365.0

	Thickness (feet)	Depth (feet)
18S/42E-22B1--Continued		
No core; tricone bit used. Cuttings and drilling characteristics indicate lithology similar to the nearby outcrops of Paleozoic limestone	10.0	375.0

19S/42E-12C1. University of Massachusetts, NP-3. Altitude about 1,542 ft. 2-inch casing 0-162 ft.

Silt, clayey, light-yellowish-brown, poor plasticity, some salt	4	4
Silt, clayey, pale-brown, poor plasticity, granulated	9	13
Silt, clayey, light-yellowish-brown, moderate plasticity, increased clay content at 13 ft	7	20
Clay, silty, pale-olive, moderate plasticity, with some sand and gravel	10	30
Clay, silty, grayish-green, with some stringers of dark-yellowish-orange	5	35
Varves, clay and silt, light-olive-gray	5	40
Clay, light-olive-gray, becomes sandy at 43 ft	5	45
Sand, very coarse, grayish-yellow-green	1	46
Silt, clayey, grayish-yellow-green	2	48
Sand, medium to fine, grayish-yellow-green	3	51
Silt, clayey, pale-brown	4	55
Clay, silty, grayish-green, with some black specks at 57 ft	7	62
Sand, very fine, grayish-yellow-green, with silt and large calcareous fragments at 65 ft	4	66
Clay, pale-olive, plastic, with white fragments at 75 ft	9	75
Clay, silty, pale-brown, moderate plasticity, crumbly texture	4	79
Clay, silty, pale-blue-green, moderate to good plasticity	5	84
No record	5	89
Clay, pale-olive, plastic	1	90
Clay, very pale green, plastic	17	107
Sand, coarse to fine, light-olive-gray, with layer of white and black pebbles at 108 ft	1	108
Clay, pale-olive; clay broken into hard aggregates	14	122
Sand, medium, pale-grayish-olive, with traces of moderate brown	6	128
Silt, clayey, moderate brown, with gradation to stones	3	131
Sand, pebbly, medium, light-olive-gray, white, angular fragments	1	132

	Thickness (feet)	Depth (feet)
19S/42E-12C1--Continued		
Sand, medium, light-olive	6	138
Sand, pebbly, medium to coarse, moderate yellowish-brown with igneous rock, black at 140 ft	2	140
Clay, very pale orange	4	144
Clay to gravel, gradation, light-olive	5	149
Clay, silty, pale-olive to dark-yellowish-brown, plastic	9	158
Sand, fine, dark-yellowish-brown, with streaks of clay, light-brown	3	161
Sand, coarse to very coarse	1	162

22S/44E-9B1. U.S. Geological Survey, holes 1 and 1a. Altitude about 1,040 ft.

No core	6.0	6.0
Silt, dusky-yellow, very well sorted, calcareous. Apparent bedding defined by color changes	34.5	40.5
Silt, clayey, to clay, grayish-yellow, well-sorted, massive, calcareous	10.3	50.8
Clay and some silt, yellowish-gray to pale-olive	4.2	55.0
Silt, clayey, yellowish-gray to dusky-yellow; fine laminar bedding; calcareous; fine beds of gypsum interspersed	4.0	59.0
Silt, clay, and a little gypsum interbedded; color ranges from medium light-gray to greenish-gray to light-greenish-gray. Gypsum is in thin beds	5.0	64.0
Clay, silty; contains nodules of limestone; light-greenish-gray; massive	1.0	65.0
Clay, silty; pockets of gypsum crystals; light-greenish-gray; thinly bedded; calcareous	6.0	71.0
Clay and a little silt, light-greenish-gray, thinly laminated, calcareous. Thin silt and clay beds are very carbonaceous, core had strong odor of H_2S when fresh	27.5	98.5
Clay and a little silt, greenish-gray. Similar to unit above. Ostracodes, two species, observed in 98 to 101 ft interval	1.0	99.5
Clay and a little silt, light-greenish-gray, thinly laminated, calcareous; very carbonaceous beds	5.5	105.0
Clay and a very small amount of silt, light-greenish-gray. Carbonaceous bedding lines, laminar, in top 20 ft; bedding is less pronounced and thicker (maximum about 1 in.) in lower part. Ostracodes observed from about 112 ft to bottom of unit; diatoms in some zones; chara at 150 ft	48.0	153.0

	Thickness (feet)	Depth (feet)
22S/44E-9B1--Continued		
Silt and a little fine sand; greenish-gray to light-greenish-gray in lower part; massive; very calcareous. Ostracodes	2.0	155.0
Clayey silt and silty clay, light-greenish-gray; no distinct bedding planes except near top where the bedding is thin; calcareous	10.0	165.0
Clay and silty clay, greenish-gray, thinly bedded, calcareous; slightly carbonaceous. Diatoms and ostracodes visible	20.0	185.0
Clay and silty clay, light-greenish-gray, massive, calcareous; salty. Contains ostracodes and diatoms	25.0	210.0
Gypsum crystal aggregate, yellowish-gray	.5	210.5
Silt and clay; color ranges from yellowish-gray to light-greenish-gray; massive; calcareous. Gypsum crystals diminish downward from 2 to 0 percent of the material. One inch of very fine sand at 227.3 ft	18.3	228.8
Sand, very fine, and silt; light-olive-gray; massive; calcareous	1.2	230.0
Silt and clay, yellowish-gray, massive, calcareous	16.6	246.6
Clay and silty clay, light-greenish-gray, fine laminations, calcareous; carbonaceous	8.4	255.0
Silt, yellowish-gray, massive, calcareous. Visible ostracodes	4.5	259.5
Silt, with much clay, very light gray, thinly bedded. At 259.9 ft there were laminae of bassanite, calcite, and gypsum	9.5	269.0
Sand, very fine, to silt, yellowish-gray, laminar bedding	1.0	270.0
Silt to clay, yellowish-gray; massive except for bottom 3 in. which are laminar; very calcareous. Ostracodes abundant	10.0	280.0
Silt, moderate grayish-yellow, massive, calcareous	7.6	287.6
Silt, greenish-gray in upper part grading to light-olive-gray in lower part; calcareous; gypsiferous, locally as much as 15 percent but overall average is 2 percent	22.4	310.0
Silt, greenish-gray, massive, slightly mottled; calcareous; carbonaceous(?)	5.0	315.0
Silt, dusky-yellow, massive, calcareous	24.8	339.8
Sand, medium, to clay; average is fine sand; very light gray to light-greenish-gray; massive; bottom 2 in. finer; calcareous in silt and clay zones	10.2	350.0
Silt, moderate grayish-yellow, massive, calcareous	8.0	358.0
Silt to fine sand, light-gray. Bedding laminar to 1 in.; irregular pods (10 percent of total volume) of pure fine-grained calcite	2.0	360.0

	Thickness (feet)	Depth (feet)
22S/44E-9B1--Continued		
Silt to fine sand, greenish-gray, massive. Up to 5 percent calcite in upper part diminishing downward. Bottom foot is conglomeratic; pebbles, up to 1 in. in size of metamorphic rock	10.0	370.0
Silt, yellowish-gray, massive, calcareous	8.4	378.4
Silt to fine sand; light-olive-gray grading to white in highly calcareous zones, massive. At 380 ft there is a pebble of subangular metamorphic rock 1 in. in diameter; may be from zone above	7.6	386.0
Silt, a little clay, light-olive-gray, massive, calcareous-	22.0	408.0
Clay, silty, to silt; pale-olive; massive; calcareous	9.0	417.0
Clay, silty; mottled colors averaging greenish-gray; calcareous	1.7	418.7
Clay, silty; pods of limestone; light-greenish-gray; fine laminar bedding	1.3	420.0
Silt to fine sand, light-greenish-gray, massive, calcareous	10.0	430.0
Carbonate, silty, white to light-greenish-gray, massive	10.0	440.0
Silt to very fine sand; light-greenish-gray to greenish-gray in mottled patterns; massive; pods of carbonate	2.0	442.0
Silt, pale-olive, calcareous, massive	8.0	450.0
Silt and a little clay, grayish-yellow, generally massive, calcareous	20.0	470.0
Silt and a little clay, yellowish-gray, with pods of white limestone; massive	1.0	471.0
Silt and a little clay, grayish-yellow, generally massive, calcareous	23.7	494.7
Silt and a little clay, yellowish-gray, and few pods of white limestone	.3	495.0
Silt and a little clay, grayish-yellow, massive, calcareous	5.0	500.0
22S/44E-9G1. University of Massachusetts. Altitude about 1,040 ft.		
Silt, clayey, dark-yellowish-brown to brown, dry, to slightly moist, with gypsum crystals at .5 ft	3	3
Interbedded clay, silt, and sand, brownish-yellow	10	13
Silt, very dark grayish brown, with some fine sand lens	2	15
Silt, coarse-grained, with abundant muscovite flakes	1	16
Silt, clayey, fine-grained, light-brown, with blotches of medium light-gray, slightly salty, sand lenses at 25 and 32 ft	17	33

	Thickness (feet)	Depth (feet)
22S/44E-9G1--Continued		
Clay and sand, alternating layers, pale-blue to grayish-yellow-green	8	41
Sand, silty, very fine, grayish-yellow-green, gradation into coarser sediment	2	43
Silt, sandy, grayish-olive to grayish-olive-green with black pebbles at 53 ft	10	53
Silt, light-olive-gray, with sand lens at 58 ft	5	58
Clay, light-olive-gray, with stringers of brownish-gray and black	3	61
Silt, sandy, light-olive-gray, with coarse sand lens at 63 ft	3	64
Interbedded clay and silt, dusty-yellow-green, with sand lens at 65 ft	4	68
Interbedded clay, silt, and sand, grayish-olive-green	5	73
Clay, dusty yellow-green with bands of black, silt lenses at 75 and 78 ft	5	78
Silt, clayey to sandy, grayish-olive-green, with black bands to 79 ft	5	83
23S/43E-28A1. American Potash and Chemical Corp., well 27. Altitude is 2,348.8 ft. Drilled by Anbrey Lyon. 12-inch casing 0-745 ft, perforated 544-724 ft.		
Sand and rock	2	2
Sand, gravel, and rock	4	6
Sand and rock, cemented	30	36
Sand and gravel	42	78
Sand, gravel, and boulders	22	100
Sand and gravel	45	145
Gravel, loose	5	150
Sand, fine	7	157
Sand with streaks of gravel	33	190
Gravel and rock, cemented	6	196
Gravel, cemented	39	235
Sand and gravel	48	283
Sand and gravel with cemented streaks	12	295
Gravel and rock	48	343
Sand and gravel	13	356
Sand, gravel and boulders	19	375
Granite boulders and gravel	85	460
Rocks with streaks of gravel	107	567
Rock, loose	10	577
Sand, gravel, and rock	63	640
Sand and gravel	105	745
Granite	12	757

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
23S/43E-31D1. H. F. Bishop. Altitude about 2,940 ft. Drilled by C. C. Scott. 4½-inch casing 0-107 ft, perforated 47-107 ft.					
"Top soil"----------	1	1	Clay, varicolored, with rock ledges--	13	66
Sand and small rocks	2	3	Clay, red, with gravel----------	7	73
Boulders----------	3	6	Granite, decomposed blue, with hard ledges----------	29	102
Sand and rocks------	5	11	Granite, decomposed blue, and fractured---------	3	105
Rocks, sand, and gravel----------	12	23	Rock, hard----------	2	107
Granite, decomposed with hard ledges--	15	38			
Granite, decomposed with streaks of clay----------	15	53			
23S/43E-33M1. Bob Archer. Altitude about 2,480 ft. Drilled by Bill Belknap. 10-inch hole 0-76 ft, casing removed.					
"Top soil"----------	2	2	Cobbles and sand----	39	57
Boulders, decomposed granite----------	2	4	Boulders----------	5	62
Cobbles and sand----	10	14	Cobbles and sand----	3	65
Boulders----------	4	18	Boulders----------	11	76
23S/44E-3N1. U.S. Geological Survey, hole 3. Altitude about 1,040 ft.					
Silt, clayey, pale-orange average color, but varies locally to medium yellowish-brown forming variegated pattern; massive. Angular fragments of mica, hornblende(?). Calcareous----------				40.0	40.0
Clay, silty; moderate brown to dark-yellowish-brown, massive. Fragments of iron oxide; about 1 percent gypsum at 50.0 ft. Calcareous. Bottom 2 ft has many angular fragments (up to 10 mm in diameter) of light-grayish-orange clay and fine sand----------				10.0	50.0
Calcium carbonate, silty; pale-greenish-yellow to white forming variegated color pattern; massive----------				9.7	59.7
Silt and halite, calcareous, grading down to halite; pale-olive to colorless. Crystals in upper part are euhedral; in lower part form solid mass----------				0.3	60.0

	Thickness (feet)	Depth (feet)
23S/44E-3N1--Continued		
Silt, grayish-orange, massive. Crystals of halite dispersed through silt; also blebs of greenish clay up to 2 mm wide	9.0	69.0
Clay, grayish-yellow-green, massive. Euhedral crystals of halite (up to 10 percent of core) throughout. Calcareous	1.0	70.0
Halite, with about 40 percent silt to very fine sand; grayish-yellow-green. Local laminar bedding. Halite is both euhedral and fragmentary. Thin bed of gypsum and halite at 78.0 ft; pure halite between 79.0 and 79.5 ft	10.0	80.0
Halite and silt, grayish-orange. Core is about 60 percent halite; a little gypsum; calcareous	10.0	90.0
Halite, generally colorless, but some included silt gives yellowish or grayish coloring; massive. Thin interbeds of silt at 105.0 ft (0.2 ft thick), 124.0 ft (0.3 ft thick), and 133.0 ft (0.2 ft thick). A little gypsum and calcite. Core from 135.0 to 159.0 ft is missing; drilling characteristics suggest same material as 90.0 to 135.0 ft interval	69.0	159.0
Silt, pale-orange, massive. Halite crystals form about 1 percent of core. Calcareous	1.0	160.0
Clay, silty, to clay. Average color is yellowish-gray with patches that are more orange or green thus giving an overall mottled effect. Poor laminar bedding in upper part, excellent laminar bedding in lower part. Halite crystals form about 5 percent of total. Solid beds of halite at 162.0 ft (0.3 ft thick) and 162.9 ft (0.2 ft thick)	4.5	164.5
Halite, colorless. Bedding, if any, destroyed by drilling. Crystals are encased in yellowish-gray clay. Halite probably formed about 90 percent of unit. A little calcite and gypsum	9.0	173.5
Clay and silty clay, yellowish-gray, laminar bedding. Halite crystals make up about 5 percent of core	.5	174.0
Halite, colorless. Bedding, if any, destroyed by drilling. Crystals encased in clay	31.0	205.0
Clay, silty, yellowish-gray, massive. Beds of solid halite at 211.5 to 212.5 ft, 214.5 to 215.0 ft, and 220.5 to 221.5 ft; a little calcite and gypsum	19.4	224.4
Halite; generally colorless or tinted gray or tan by included clay; massive(?). A little gypsum and calcite. This section cored very poorly and the resulting "core" consisted of wafers of halite and piles of broken halite crystals	40.6	265.0
Clay, silty, to clay; pale-greenish-yellow to yellowish-gray; massive. Contains small amounts of halite and gypsum; calcareous	8.5	273.5

	Thickness (feet)	Depth (feet)
23S/44E-3N1--Continued		
Clay, a little silt and sand; yellowish-gray with mottled patches of darker material; massive. Calcareous---------	1.5	275.0
Clay, a little silt, a very little fine sand. Color ranges between yellowish-gray and grayish-yellow; local lenses of pale-olive. From 275.0 to 298.0 ft the color emphasized the beds (the coarser sediments are greener, the finer are more yellow); from 298.0 to 330.0 ft the unit was massive. Calcareous, increasing downward-------	55.0	330.0
Clay, a little silt, a very little fine sand. Colors range between yellowish-gray, pale-greenish-yellow, and pale-olive; average is toward pale-olive. Color banding but no apparent lithologic bedding. Noncalcareous except for bottom ft----------	15.0	345.0
Clay, pale-greenish-yellow, massive; very calcareous; 1-in. beds of gypsum at 351.0 and 352.0 ft----------	9.4	354.4
Silt, calcareous, and gypsum; greenish-gray to white; massive. Megascopic crystals of gypsum (from 10 to 50 percent of core) in a matrix of calcareous silt; the calcite content is between 30 and 90 percent----------	10.6	365.0
Clay, with pods of calcium carbonate. Dark-greenish-gray and moderate brown mixed with some streaks and pods of white, still damp. Texture is contorted; may have been bedded----------	10.0	375.0
Silt, light-greenish-gray to very light gray, massive; very calcareous; a few crystals of gypsum up to 4 mm long	9.0	384.0
Gypsum and calcite, very light gray, massive. Crystals of gypsum up to 1 mm long----------	1.0	385.0
Gypsum and halite, silty, light-greenish-gray; massive. Gypsum and halite form up to 90 percent of core; average is about 70 percent----------	10.0	395.0
Clay with pods of calcite, dark-greenish-gray and moderate brown, still damp. Texture contorted----------	6.0	401.0
Halite and silt, colorless crystals----------	.3	401.3
Clay, silty, light-dusky-yellow, massive. Some isolated halite crystals; calcareous----------	6.7	408.0
Silt, grayish-olive, still damp; massive. May be cuttings, not core----------	4.0	412.0
Clay, silty, light-dusky-yellow; laminar bedding. A little halite; calcareous----------	3.0	415.0
Silt, grayish-olive, massive. May be cuttings, not core---	3.0	418.0
Clay and a little silt interbedded. Dusky-yellow clay and yellowish-gray silt. Bedding of two types: one is laminar; the other is about 20 mm thick. Section about 90 percent clay. Calcareous----------	6.3	424.3

	Thickness (feet)	Depth (feet)
23S/44E-3N1--Continued		
Halite, colorless crystals (usually covered with clay); massive. A little gypsum and calcite. Some beds of silt included in the core are probably cuttings, not core-----	25.0	449.3
Sand, very fine, yellowish-gray. Bedding faint, about 5 mm average thickness. Well sorted. well indurated. Calcareous----------	.7	450.0
Clay and a little silt interbedded. Dusky-yellow clay and yellowish-gray silt. Well bedded. Calcareous. Top foot is still damp; presumably cuttings, not core----------	4.0	454.0
Silt. Between yellowish-gray, light-olive-gray, and pale-olive; average is toward pale olive. Laminar bedding. Carbonaceous partings. Calcareous; salty------	2.6	456.6
Clay and a little silt in upper half grading to silt in lower half. Dusky-yellow and yellowish-gray in upper half; pale-olive in lower half. Entire unit well bedded. Carbonaceous partings. Calcareous----------	3.4	460.0
Clay and a little halite. Clay is dusky blue, still damp. Halite forms about 10 percent of core----------	1.0	461.0
Halite, colorless; tan or gray clay coating on crystals; massive. A 1-in. silt bed at 464.5 ft. Upper two-thirds about 20 percent clay; lower one-third about 2 percent clay----------	13.0	474.0
Silt and clay, pale-olive. Bedding 1 to 10 mm thick; defined by color banding. Pods of white (gypsum?).------	5.7	479.7
Clay and halite. Clay is pale olive; halite is colorless. Fine bedding. Ratio of halite to clay is 1 to 1. A little calcite.----------	5.3	485.0
Halite; a little clay. Halite is colorless. Massive(?). A little calcite and gypsum. Top contact is gradational; basal contact is sharp. Core is very poor and bedding is not recognizable; the section drilled as if massive salt-	46.0	531.0
Clay, yellowish-gray to pale-olive. Bedding is distinct, units 1 to 10 mm thick; some partings appear carbonaceous. Calcareous----------	14.0	545.0
Silt; yellowish-gray, darker where core is still damp; massive to mottled texture. Fragments of halite and gypsum, the percentage increasing downward; calcareous---	10.0	555.0
Calcite and gypsum encased in mud, greenish-gray. Core is about 90 percent crystals----------	1.0	556.0
Silt, yellowish-gray, massive, slightly calcareous---------	1.0	557.0
Halite; a little clay. Colorless halite; clay is greenish gray. Massive----------	2.5	559.5
Clay, yellowish-gray to light-greenish-gray, mottled coloring; generally massive, local thin bedding; calcareous----------	10.0	569.5
Clay grading down to silt, yellowish-gray. Bedding fine up to 10 mm. Calcareous. Fine sand, 576.0 to 577.0 ft--	15.8	585.3

	Thickness (feet)	Depth (feet)
23S/44E-3N1--Continued		
Clay, yellowish-gray to very pale orange, massive, calcareous	4.7	590.0
Silt to fine sand; yellowish-gray to pale-olive, patches of white; massive. Pods and small lenses of gypsum and halite at 596.0 ft	6.5	596.5
Clay, yellowish-gray to very pale orange, generally massive, calcareous	4.5	601.0
Silt grading downward to very coarse sand with silt matrix, yellowish-gray, massive, calcareous and gypsiferous, from 603.0 to 604.0 ft gypsum forms up to 30 percent of core	9.0	610.0
Silt and fine sand grading down to fine sand, light-olive-gray, massive, slightly calcareous	14.0	624.0
Tuff, mixed with very fine sand; very light gray. Fine bedding defined by black streaks of carbon or biotite. Very well indurated	.3	624.3
Sand, very fine, yellowish-gray, massive. Calcareous	31.7	656.0
Silt to very fine sand, yellowish-gray; very faint bedding to massive; very well sorted. Calcareous; a 1-ft bed of calcareous silt at 724.0 ft. Many flakes of mica, up to 0.5 mm wide	129.0	785.0
Clay, silty, yellowish-gray, massive(?), slightly calcareous	9.0	794.0
Sand, very fine, yellowish-gray, massive. A little gypsum; calcareous	1.0	795.0
Silt; very little fine sand; dark-yellowish-gray. Bedding in top ft 1 to 10 mm thick; appears to be at an angle of about 60° to the sides of the core; probably a result of drilling pressures	6.0	801.0
Silt to very fine sand, dark-grayish-yellow, massive, very slightly calcareous	4.0	805.0
Silt to very fine sand, dark-yellowish-gray, massive. A little gypsum	9.2	814.2
Silt to very fine sand, dark-grayish-yellow; faint bedding; slightly calcareous	.8	815.0
Silt to very fine sand, yellowish-gray to dark-grayish-yellow. Some faint laminar bedding but generally massive. Slightly (about 0.5 percent) gypsiferous; calcareous; flakes of mica common	14.3	829.3
Clay, gypsiferous, silty, dark-grayish-yellow, mottled coloring. Gypsum forms 5 to 20 percent of core, average 10 percent; found as bladed crystals up to 10 mm long. Very slightly calcareous	5.7	835.0
Clay and a little silt. Dusky-yellow clay and yellowish-gray silt. Massive	9.5	844.5
Silt, gypsiferous(?); very light greenish gray, lenses of white	.5	845.0

	Thickness (feet)	Depth (feet)
23S/44E-3N1--Continued		
Silt, greenish-gray. Locally shows faint bedding up to 10 mm thick but is generally massive. Lenses of anhydrite and gypsum; very slightly calcareous----------	10.0	855.0
Clay, silty, yellowish-gray; massive, generally with local laminar bedding; calcareous, a little gypsum----------	10.0	865.0
No core----------	10.0	875.0
No core; solid bit used; the material is presumably similar to that at 865.0 ft----------	20.0	895.0
Clay, very little silt and very fine sand; dark-grayish-yellow. Very well bedded; laminar to 20 mm thick in upper part, grades down to massive. Black partings of carbon or biotite in upper part. Calcareous, a little anhydrite(?)----------	18.0	913.0
Clay; yellowish-gray to light-olive-gray in lower part. Lenses (up to 1 mm thick) of biotite(?). Excellent laminar bedding. Calcareous----------	1.6	914.6
Sand, fine, dusky-yellow, poorly sorted, massive----------	.4	915.0
Silt to very fine sand, yellowish-gray. Massive in upper half grading to very faint bedding in lower half. Calcareous; gypsiferous----------	16.4	931.4
Silt, yellowish-gray. Excellent laminar bedding; partings of black biotite(?). Calcareous----------	3.6	935.0
Clay, silty, to silt; light-greenish-gray; massive. Gypsum at 937.0 ft----------	10.0	945.0
Clay to silt, yellowish-gray to light-olive-gray. Fine bedding; laminar to 15 mm thick. Some partings of biotite silt. Small lamellae of gypsum(?) and anhydrite-	20.0	965.0
Silt with thin beds of gypsum(?) and anhydrite(?); yellowish-gray. Silt beds are well sorted and well indurated. Gypsum(?) and anhydrite(?) form about 10 percent of the core. No core recovered from 965 to 973 ft but drilling characteristics indicate a well-indurated material similar to the recovered core----	20.0	985.0
No core; drilled as if very hard material, like unit above-	10.0	995.0

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

24S/43E-7J1. American Potash and Chemical Corp., well 14. Altitude about 2,200 ft. Drilled by Lyon Bros. 14-inch casing 0-270 ft, 10-inch casing 100-275 ft, and 7-5/8-inch casing 212-453 ft, perforated 230-453 ft.

Sand----------	28	28	Granite with seams of fine sand------	13	218
Sand and small boulders----------	7	35	"Decomposed granite" and clay----------	37	255
Sand with small gravel----------	15	50	Granite boulders, very hard---------	4	259
Sand and gravel-----	15	65	"Granite"----------	16	275
Gravel, fine--------	5	70	Sandstone with hard streaks----------	70	345
Clay, sandy---------	6	76	Granite, hard-------	75	420
Sand----------	9	85	Conglomerate and clay----------	45	465
Sand and broken rock----------	22	107	"Granite"----------	13	478
"Granite" with crevices----------	8	115	"Granite," very hard	22	500
"Decomposed granite" with streaks of hard clay---------	90	205			

24S/43E-7P1. American Potash and Chemical Corp., well 13. Altitude about 2,450 ft. Drilled by Lyon Bros. 6-inch casing 0-286 ft, 4-inch casing 286-325 ft, perforated 150-325 ft.

Sand, coarse--------	17	17	Granite, hard with streaks of salt---	42	186
Boulders, small-----	3	20	Rock, very hard-----	53	239
Sand, coarse--------	18	38	Rock with clay seams	29	268
Rock, broken--------	9	47	Clay conglomerate (well produced 5 gpm from this unit)----------	9	277
"Decomposed granite"	12	59	Rock----------	3	280
Seamed rock---------	4	63	Granite, hard-------	7	287
"Granite," hard and broken--------	7	70	Rock, broken--------	23	310
"Decomposed granite"	40	110	Rock, hard and broken with seams of loose rock-----	15	325
"Granite"----------	7	117			
Gravel and clay, cemented----------	16	133			
Conglomerate and clay----------	11	144			

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

24S/43E-9P1. American Potash and Chemical Corp., well 32. Altitude is 2,017.1 ft. Drilled by Jack Cannon. 14-inch casing 0-600 ft, perforated 404-407, 413-429, 433-451, 461-474, 480-510, and 550-570 ft.

Sand and gravel, loose	2	2	Clay and gravel, brown and sandy	10	480
Sand, gravel, and clay	187	189	Sand and gravel, very fine, gray and silty	12	492
Sand and clay, gray and silty	16	205	Sand, gravel and boulders, cemented	8	500
Sand, gravel, and clay, brown	202	407	Sand, very fine, gray, and silty, with some gravel to ¼ in.	45	545
Sand, fine and silty, with gravel to 1 in.	3	410	Clay, brown and sandy, with some gravel	7	552
Clay and gravel, brown and sandy	2	412	Sand, gray, and gravel to ¼ in.	6	558
Sand and gravel to ¼ in., loose	6	418	Clay, brown, and gravel	7	565
Sand and gravel, with some brown clay	29	447	Sand and gravel, gray and silty	35	600
Clay and gravel, brown and sandy	3	450			
Sand, very fine, gray, and silty, with some gravel to ¼ in.	20	470			

24S/43E-14L1. Stockwell Gold Mine Co. Altitude about 1,913 ft. Drilled 276-436 ft by Bill Belknap. 96-inch hand-dug pit to 280 ft, 8-inch casing 276-436 ft, perforated 340-434 ft.

Old pit	280	280	Clay, gray	4	392
Sand, coarse	10	290	Sand	8	400
Clay, gray	14	304	Sand and cobbles, cemented	10	410
Sand and rocks	34	338	Sand	4	414
Sand, coarse	24	362	Sand and cobbles	22	436
Clay, gray	6	368			
Shale	20	388			

24S/43E-21J1. American Potash and Chemical Corp., well 12. Altitude is 1,751.4 ft. Drilled by Lyon Bros. 12-inch casing 0-300 ft, perforated 105-126, 133-140, 145-157, 161-175, 182-186, 200-221, 236-249, and 251-260 ft.

	Thickness (feet)	Depth (feet)
Sand and gravel-----	23	23
Sand, gravel and clay----------	42	65
Sand, fine, gravel--	5	70
Conglomerate--------	5	75
Sand, fine, and coarse gravel-----	14	89
Clay, hard and white----------	11	100
Gravel, cemented----	5	105
Sand and gravel-----	21	126
Gravel, cemented----	7	133
Sand and gravel-----	7	140
Sand, "heaving"-----	5	145
Sand and gravel-----	12	157
Clay, white---------	4	161
Sand and gravel-----	14	175
Clay, hard and sandy----------	7	182
Sand and gravel-----	4	186
Clay and gravel, cemented----------	10	196
Clay----------	4	200
Sand and gravel, coarse----------	6	206
Conglomerate, loose-	5	211
Sand and gravel-----	10	221
Sand, gravel, and clay----------	9	230
Clay, hard----------	6	236
Conglomerate, loose-	13	249
Clay----------	2	251
Sand, gravel and clay----------	9	260
Clay and gravel, cemented----------	13	273
Sand, gravel, and clay----------	8	281
Gravel, loose, and fine sand---------	3	284
Conglomerate	3	287
Clay, hard----------	5	292
Gravel, cemented----	3	295
Conglomerate--------	2	297
Clay----------	3	300

24S/43E-22G1. American Potash and Chemical Corp., well 33. Altitude is 1,822.2 ft. Drilled by Roscoe Moss Co. 14-inch casing 0-400 ft, perforated 204-230 and 250-350 ft.

	Thickness (feet)	Depth (feet)
Sand and gravel, loose----------	12	12
Sand and gravel with some gray clay----	22	34
Clay, gray, and gravel----------	40	74
Sand and gravel-----	16	90
Sand, gray, clay and gravel----------	40	130
Clay, brown and sandy, with some gravel----------	34	164
Clay, gray and sandy, and gravel-	6	170
Clay, brown and sandy, and gravel-	34	204
Sand, gray, clay and gravel to 2 in.	18	222
Sand and gravel to 2 in.----------	8	230

	Thickness (feet)	Depth (feet)
24S/43E-22G1--Continued		
Clay, brown and sandy, and gravel-	10	240
Clay, gray----------	11	251
Gravel to 1 in. and brown clay--------	27	278
Clay, gray and sandy, and gravel-	4	282
Clay, brown and sandy, and gravel-	30	312
Gravel, 1¼-in., and sandy clay--------	10	322
Clay, gray----------	14	336
Gravel to 1 in.-----	36	372
Clay, brown and sandy----------	28	400

24S/43E-22M1. American Potash and Chemical Corp., well 19. Altitude is 1,763.8 ft. Drilled by Lyon Bros. 16-inch casing 0-351 ft, perforated 135-154, 162-195, 200-235, 240-288, 291-309, and 317-330 ft.

Sand and gravel-----	8	8
Silt, packed--------	3	11
Sand and gravel-----	62	73
Clay and gravel-----	26	99
Sand and gravel-----	59	158
Clay----------	4	162
Sand and gravel-----	25	187
Sand, gravel, and broken rock, cemented----------	8	195
Clay----------	3	198
Sand and gravel-----	37	235
Clay----------	4	239
Sand and gravel, cemented----------	18	257
Sand and gravel-----	32	289
Clay----------	1	290
Sand and gravel-----	43	333
Clay, very hard, sandy and blue----	18	351

24S/43E-22M2. American Potash and Chemical Corp., well 25. Altitude is 1,774.6 ft. Drilled by J. W. Burkhart. 16-inch casing 0-348 ft, perforated 144-151, 158-167, 216-218, 253-273, 305-310, 314-318, and 336-339 ft.

Soil, sandy---------	9	9
Clay, white---------	4	13
Clay, sandy---------	15	28
Clay, white---------	11	39
Clay, sandy---------	33	72
Gravel and clay-----	17	89
Clay, white---------	17	106
Clay with gravel----	38	144
Sand----------	7	151
Clay, sandy---------	7	158
Sand, coarse, and ¼-in. gravel------	9	167
Clay, gray----------	19	186
Clay, sandy---------	18	204
Clay, gray----------	4	208
Clay, sandy---------	8	216
Gravel----------	2	218
Clay, sandy---------	26	244
Clay----------	9	253
"Pea" gravel--------	11	264

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
24S/43E-22M2--Continued					
Clay and gravel, cemented----------	9	273	Gravel----------	4	318
Clay, sandy---------	32	305	Clay----------	18	336
Sand and gravel, cemented----------	5	310	Sand and gravel, cemented----------	3	339
Clay----------	4	314	Clay, sandy---------	9	348
			Clay, blue----------	2	350

24S/43E-22N1. American Potash and Chemical Corp., well 29. Altitude is 1,758.8 ft. 16-inch casing 0-367 ft, perforated 147-215, 218-271, 309-318, and 327-348 ft.

"Top soil"----------	3	3	Clay----------	4	175
Sand and rock, cemented----------	5	8	Sand, fine, and gravel----------	32	207
Clay, white---------	7	15	Sand and gravel-----	8	215
Sand, gravel, and clay----------	16	31	Clay----------	3	218
Sand with some clay-	11	42	Clay, sandy, with gravel----------	53	271
Sand, fine and white	11	53	Sand and gravel-----	30	301
Sand and clay-------	10	63	Clay----------	4	305
Sand with small gravel----------	22	85	Silt, sandy---------	4	309
Sand----------	12	97	Sand, fine and cemented----------	9	318
Clay----------	5	102	Sand and gravel with clay----------	9	327
Sand----------	45	147	Sand and gravel-----	27	354
Sand and gravel-----	24	171	Clay, sticky--------	13	367

24W/43E-22N2. American Potash and Chemical Corp., well 21. Altitude about 1,756 ft. Drilled by Lyon Bros. 14-inch casing 0-304 ft, perforated 122-135, 176-202, 204-244, and 256-278 ft.

Gravel----------	96	96	Gravel, "mucky"-----	12	212
Gravel, coarse------	44	140	Clay and rock-------	44	256
Gravel and rock, dirty----------	60	200	Gravel, coarse------	10	266
			Gravel, "mucky"-----	38	304

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

24S/43E-22N3. American Potash and Chemical Corp., well 2. Altitude is 1,755.7 ft. Drilled by Roscoe Moss Co. 14-inch casing 0-300 ft, perforated 122-135, 174-202, 204-244, 256-278 ft.

Gravel----------	26	26	Cement and gravel---	10	122
Clay----------	2	28	Sand----------	13	135
Gravel and sand-----	10	38	Sand, "heaving"-----	30	165
Gravel, cemented----	6	44	Clay----------	9	174
Sand----------	8	52	Gravel, cemented----	28	202
Cement and gravel---	8	60	Clay----------	2	204
Sand----------	16	76	Gravel----------	40	244
Cement and gravel---	12	88	Clay----------	12	256
Sand----------	6	94	Gravel----------	22	278
Clay----------	3	97	Gravel, cemented----	17	295
Cement and gravel---	12	109	Sand----------	5	300
Clay----------	3	112			

24S/43E-32L1. American Potash and Chemical Corp., well 26. Altitude is 1,702.1 ft. 16-inch casing 0-94 ft, and 12-inch casing 94-130 ft, perforated 67-130 ft.

Rock, broken and dirt----------	3	3	Boulders, broken, very hard---------	19	65
Sand, cemented, and clay----------	3	6	Boulders and sand---	8	73
Gravel and boulders, cemented	33	39	Granite rock, broken	5	78
Clay and boulders---	3	42	Boulders, loose-----	2	80
Rock and boulders, cemented----------	4	46	Sand, gravel, and boulders----------	50	130
			Gravel and boulders, cemented----------	8	138

24S/43E-32Q2. E. O. Ford. Altitude about 1,685 ft. 8-inch casing 0-76 ft, perforated 60-74 ft.

Sand and gravel-----	18	18	Clay, gray and gravel----------	3	55
Cobbles, big, laying in decomposed granite----------	14	32	Rock and decomposed granite----------	17	72
Rock and decomposed granite----------	20	52	Sand and cobbles----	4	76

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

25S/43E-3L1. Searles Lake Chemical Co. Altitude is 1,622.8 ft. 6-inch casing 0-35 ft, open hole 35-154 ft.

Clay and sand-------	7	7	"Black and gray," some crystals-----	65	145
Mud, black (like ooze)----------	53	60	Mud----------	9	154
Mud, some trona crystals----------	20	80			

25S/43E-10B1 and 10B2. U.S. Geological Survey, well GS-40. Altitude about 1,621 ft. 16- and 3½-inch casings.

Clay----------	31	31	Clay and salts------	2	41
Clay and salts------	1	32	Sand----------	2	43
Sand----------	6	38	Clay----------	19	62
Sand and salts------	1	39	Clay, salts, and sand----------	28.6	90.6

For detailed log, see pl. 8, U.S. Geol. Survey Bull. 1045-A.

25S/43E-10G1. U.S. Geological Survey, well GS-1. Altitude about 1,621 ft. 10-inch casing inside 16-inch casing.

Clay----------	28	28	Clay and salts------	4	76
Clay and salts------	1	29	Sand----------	4	80
Salts----------	8	37	Clay and salts------	5	85
Sand----------	9	46	Sand----------	1	86
Clay with salt and minor quantity of sand----------	22	68	Clay and salts with minor quantity of sand----------	6.8	92.8
Sand----------	4	72			

For detailed log, see pl. 7, U.S. Geol. Survey Bull. 1045-A, or p. 152, U.S. Geol. Survey Bull. 1045-E.

25S/43E-17D1. American Potash and Chemical Corp., well 11. Altitude is 1,691.1 ft. Drilled by Lyon Bros. 16-inch casing 0-292 ft, perforated 50-62, 120-135, and 145-270 ft.

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Sand----------	18	18	Clay, blue----------	9	114
Conglomerate, cemented----------	7	25	Sand, blue, and sandstone---------	5	119
Sand----------	17	42	Boulders, cemented--	7	126
Clay, white---------	9	51	Sand and boulders---	9	135
Boulders, cemented--	3	54	Sand and clay-------	10	145
Gravel, sand, and boulders----------	9	63	Boulders, cemented--	8	153
Sand, blue----------	15	78	Sand and boulders---	12	165
Gravel and boulders, cemented----------	4	82	Clay and gravel-----	9	174
Sand, blue----------	18	100	Boulders and clay---	4	178
Clay, blue, and sand	5	105	Boulders, cemented--	102	280
			Clay, blue----------	10	290
			Boulders, cemented--	2	292

25S/43E-17D2. American Potash and Chemical Corp., well 31. Altitude is 1,702.5 ft. Drilled by Evans Bros. Drilling Co. 14-inch casing 0-326 ft, perforated 73-326 ft.

Sand and gravel-----	54	54	Sand----------	11	145
Clay, sticky and white----------	4	58	Boulders----------	11	156
Sand----------	3	61	Sand and boulders---	8	164
Rock----------	4	65	Boulders----------	37	201
Sand, hard----------	5	70	Rock----------	17	218
Boulders----------	7	77	Sand and boulders---	54	272
Sand, fine and gray-	13	90	Clay, light-green---	21	293
Sand and boulders---	10	100	Boulders----------	5	298
Clay, blue----------	12	112	"Granite"----------	7	305
Sand and boulders---	8	120	Sand and boulders---	7	312
Conglomerate--------	14	134	Boulders----------	8	320
			Sand and boulders---	6	326

	Thickness (feet)	Depth (feet)
25S/43E-17D3. American Potash and Chemical Corp., well 10. Altitude is 1,704.0 ft. Drilled by Roscoe Moss Co. 14-inch casing 0-325 ft, perforated 58-100, 110-160, 164-269, 282-299, and 308-322 ft.		
Sand	14	14
Sand, cemented	36	50
Clay, white	6	56
Sand, gravel, and boulders	8	64
Sand, blue with small gravel	19	83
Sand, blue, gravel and boulders	17	100
Clay, blue	10	110
Sandstone in thin layers	7	117
Gravel and boulders, cemented	43	160
Clay, yellow	4	164
Gravel and boulders, cemented	56	220
Sand, gravel, and boulders	31	251
Gravel and boulders, cemented	18	269
Clay, blue	12	281
Sand, gravel, and boulders	5	286
Conglomerate	10	296
Clay, gravel, and boulders	3	299
"Granite"	9	308
Gravel and boulders-	7	315
Boulders, cemented--	3	318
Gravel and boulders-	5	323
"Granite"	18	341

	Thickness (feet)	Depth (feet)
25S/43E-17D4. American Potash and Chemical Corp., well 24. Altitude about 1,705 ft. Drilled by J. W. Burkhart. 16-inch casing 0-203 ft, perforated 84-195 ft.		
"Top soil," sandy---	31	31
"Fill" with boulders, yellow	7	38
Clay, white	11	49
Clay with boulders, yellow	11	60
Sand, very fine	24	84
Gravel and sand with some clay	15	99
Clay, blue	12	111
Clay, green and sandy	10	121
Sand and gravel, solid layers cemented	10	131
Sand and gravel with some clay	27	158
Gravel with some clay	4	162
Gravel and boulders, cemented	79	241

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Sand and gravel, packed	17	17	Clay, sandy, and gravel	5	119
Boulders	5	22	Gravel, boulders, and clay, cemented	11	130
Sand and gravel	6	28	Clay, blue, and boulders	15	145
Boulders	5	33	Boulders	4	149
Sand, gravel, and boulders	9	42	Clay, blue, and gravel	6	155
Clay, white, and boulders	6	48	Gravel and boulders, cemented	89	244
Sand, clay, and boulders, blue	35	83	Sand, gravel and boulders	14	258
Sand and gravel, blue	16	99	Clay, white	13	271
Clay, blue	13	112	Gravel and boulders	30	301
Boulders	2	114			

25S/43E-17D6. American Potash and Chemical Corp., well 18. Altitude is 1,700.3 ft. Drilled by Barber and Bridges Drilling Co. 14-inch casing 0-301 ft, perforated 114-283 ft.

25S/43E-21M1. American Potash and Chemical Co. Altitude about 1,617 ft. Drilled by John and Dennis Searles. Drilled to 300 ft in 1887 and deepened to 627 ft in 1896.

	Thickness (feet)	Depth (feet)
Salt and thenardite	2	2
Clay and volcanic sand, containing a few crystals and bunches of hanksite	4	6
Volcanic sand and black tenacious clay, with bunches of trona having black, shining luster, from enclosed mud	8	14
Volcanic sand, containing glauberite, thenardite, and a few flat hexagonal crystals of hanksite	8	22
Solid trona, overlain by a thin layer of very hard material	28	50
Mud, black, soft, slushy, smelling of H_2S and containing layers of glauberite, soda, and hanksite; water has a density of 30° Baumé	20	70
Clay, brown, mixed with volcanic sand and permeated with H_2S. (At 300 feet "a hard streak of lime, mixed with alumina and silica; very strong test for borax.")	230	300
Mud, fine, greenish (in the dry sample as preserved), filled with broken fragments of clear glassy pirssonite, which constituted the major portion of the sample saved, including also trona, some halite, and sand grains	127	427

	Thickness (feet)	Depth (feet)
25S/43E-21M1--Continued		
Pirssonite, in broken fragments, as a fine clean glassy sand, this mineral constituting 90 percent or more of the sample. Contains some northupite, halite, an unknown mineral called *a*, and sand grains. The northupite is in clear perfect octahedrons. Drill record said "crystal; drilling as hard as rock."---------	15	442
Pirssonite, in glassy crystalline fragments, mostly broken but some showing distinct crystal terminations, stained greenish with a small amount of mud or clay. This sample evidently represents a stratum encountered within the interval recorded. The mineral northupite is described as having been first found in clay at a depth of 450 ft in this well. E. S. Larsen reported as follows from an optical examination of this sample, "largely made up of pirssonite, and trona, with some halite, northupite, unknown mineral *a*, and sand grains." The northupite is in clear and perfect octahedrons----------	27	469
Clay, fine, light-colored, powdery material according to dry sample, which, when examined under the microscope, proves to contain many small crystals of calcite. There is some halite, northupite, trona, minerals, thenardite, and sand grains----------	31	500
Clay, sample marked "Mud, green, with strong ammonia smell," recorded as from depth of 506 feet. The dry sample is a light-greenish clay filled with pirssonite fragments. Microscopic examination showed that the sample was about three-fourths pirssonite, with halite, northupite, thenardite, mineral *a*, claylike material, and a very few sand grains----------	15	515
Clay, light-brownish in dry sample, containing various insoluble mineral grains. Microscopic examination showed a few grains of pirssonite, numerous crystals of calcite embedded in halite and minutely crystalline material, probably clay, and some sand grains. "Borax present from surface water, not from actual crystals."---	5	520
"A hard streak 3 feet thick, test strong in borax"---------	3	523
No record. At 527 feet "Water from this level crystallized large cube salt in abundance when left to stand. Water also when evaporated gave very strong test in borax."----------	4	527
Clay; dry sample, light-gray, containing crystals of calcite----------	8	535

	Thickness (feet)	Depth (feet)
25S/43E-21M1--Continued		
Shale; sample consisted of several consolidated fragments, a massive aggregate composed chiefly of pirssonite, with some halite and trona, a very little sand and clay, and a few spherulites of searlesite, the whole apparently representing a consolidated thin-bedded layer. Spherulites; small rounded grains of light-gray color, containing carbonates (effervescing with acid), with some grains of quartz, feldspar, etc. Mineralogically composed of searlesite in clusters of radiating fibers with calcite embedded in it----------	5	540
Mud or clay, grayish, finely powdered in dry sample as preserved. Contains numerous crystals of calcite embedded in halite and a minutely crystalline material, probably clay, also some sand grains----------	35	575
Clay, with a white limy appearance; light, finely powdered in dry sample as preserved----------	5	580
No record----------	6	586
Clay finely pulverized; light-gray in dry sample. Contains more sand grains and a few larger grains of pirssonite which might have been brought down from above----------	10	596
Clay, light-greenish-gray; a dry powdery sample. Crystalline material marked "Crystal deposited by standing overnight from water at 600 feet; source of water we presume 400 feet." Consists of a reddish granular and powdered crystalling aggregate colored by iron, perhaps from rusty well casing or tools. Crystalline material, apparently duplicate of above, marked "Crystal deposited by letting water from 600 feet stand." A reddish granular and pulverulent mass, about three-fourths thenardite, with considerable halite in clear grains, some grains of unknown mineral *a*, and a few grains of sand and iron rust----------	4	600
Clay, in flakes of greenish color; under microscope is shown to be made up of calcite, halite, claylike material, and about 10 percent sand grains. This sample is probably in large part of detrital material. Sample marked "Soft clay underlying hard streak"----------	20	620
Mud, dried in sample as preserved, containing carbonates and grains of other minerals. Marked "Deep well, Mar. 9, 1896. Soft clay overlying at hard streak 25 feet"----------	5	625
Mud, "fine-grained black and gray"; sample is now dry and in finely powdered state. Black turns gray on exposure"-	2	627
Clay, fine greenish-gray pulverulent material, which under the microscope appeared to be mainly clay containing calcite and halite, but with a larger percentage of sand grains----------	.8	627.8

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

25S/43E-24R1 and 24R2. U.S. Geological Survey, well GS-2. Altitude about 1,617 ft. 10- and 3½-inch casings.

Salts and clay------	13	13	Sand and salts------	5	56
Sand----------	1	14	Clay and salts------	15	71
Salts and clay------	12	26	Sand and salts------	3	74
Salts and sand------	5	31	Clay and salts------	3	77
Salts----------	2	33	Sand and salts------	14	91
Sand----------	1	34	Clay----------	1	92
Salts----------	3	37	Sand----------	1	93
Sand----------	1	38	Clay----------	1	94
Salts with minor quantities of sand	13	51	Sand and salts------	2	96
			Clay and salts------	11.3	107.3

For detailed log, see p. 156 and pl. 7, U.S. Geol. Survey Bull. 1045-E.

25S/43E-31M1. Stauffer Chemical Co., well 5. Altitude about 1,680 ft. Drilled by Pattman Drilling Co. 10-inch casing 0-153.5 ft, perforated 53.5-153.5 ft.

Rock and boulders---	45	45	Rock and boulders---	4	136
Sand and boulders---	3	48	Sand, coarse, and gravel----------	11	147
Rock and boulders---	22	70	Rock and boulders---	2	149
Sand, coarse, and gravel----------	5	75	Sand, coarse, and gravel----------	4	153
Gravel and boulders-	1	76	Rock and boulders---	.5	153.5
Rock and boulders---	3	79			
Gravel, boulders, and coarse sand---	53	132			

25S/43E-31N1. Stauffer Chemical Co., well 4. Altitude about 1,680 ft. 12-inch casing.

Rock and sand-------	10	10	Rock, coarse--------	12	62
Clay----------	10	20	Sand and gravel-----	33	95
Rock----------	10	30	Sand, fine, and clay----------	13	108
Clay----------	20	50			

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
25S/43E-32H1 and 32H2. U.S. Geological Survey, well GS-18. Altitude about 1,618 ft. 16- and 3½-inch casing.					
Clay	22	22	Salts and sand	10	87
Salts and sand	25	47	Clay and sand	1	88
Sand	8	55	Sand	1	89
Clay with minor quantities of salts	11	66	Clay, salts, and sand	4	93
Sand	1	67	Sand	3	96
Clay and salts	3	70	Clay and salts	2	98
Sand	5	75	Sand	1	99
Clay and salts	2	77	Clay and salts	5.3	104.3
For detailed log, see pl. 7, U.S. Geol. Survey Bull. 1045-E.					
25S/43E-32Q1 and 32Q2. U.S. Geological Survey, well GS-9. Altitude about 1,621 ft. 16- and 3½-inch casing.					
Clay	37	37	Clay and salts	2	81
Clay and salts	1	38	Sand	3	84
Sand	1	39	Salt	2	86
Salts and sand	8	47	Sand	2	88
Sand	11	58	Clay and salts	2	90
Clay and salts	12	70	Sand	1	91
Sand	3	73	Clay and salts	1	92
Clay and salts	2	75	Sand	3	95
Sand	4	79	Clay and salts	8.5	103.5
For detailed log, see p. 181 and pl. 7, U.S. Geol. Survey Bull. 1045-E.					
25S/43E-33F1 and 33F2. U.S. Geological Survey, well GS-17. Altitude about 1,619 ft. 10- and 3-inch casing.					
Sand	22	22	Sand	4	81
Salts, clay, and sand	9	31	Salts and sand	6	87
Salts and sand	16	47	Clay and salts	1	88
Sand	4	51	Salts and sand	12	100
Salts and sand	7	58	Sand, clay, and salts	14	114
Sand, some salts	6	64	Clay	4.3	118.3
Clay, some salts	13	77			
For detailed log, see pl. 7, U.S. Geol. Survey Bull. 1045-E.					

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

25S/43E-33P1 and 33P2. U.S. Geological Survey, well GS-8. Altitude about 1,620 ft. 16- and 3½-inch casings.

Clay----------	32	32	Clay and salt-------	2	72
Salts and clay------	4	36	Sand----------	4	76
Sand----------	2	38	Clay and salt-------	3	79
Salt with minor quantities of sand	13	51	Sand----------	5	84
Sand----------	3	54	Salt----------	1	85
Clay with minor quantities of salt	13	67	Sand----------	4	89
Sand with minor quantities of salt	3	70	Clay and salt and sand----------	8	97
			Clay and salt-------	5.4	102.4

For detailed log, see pl. 7, U.S. Geol. Survey Bull. 1045-E.

25S/43E-33R1 and 33R2. U.S. Geological Survey, well GS-10. Altitude about 1,620 ft. 16- and 3½-inch casing.

Clay----------	32	32	Clay with minor quantities of salts----------	8	78
Salts, clay and sand	11	43	Sand, clay, and salts----------	14	92
Salts and sand------	13	56	Salts and sand------	11	103
Sand----------	1	57	Clay----------	2	105
Salts----------	2	59	Sand, clay, and salts----------	9	114
Sand----------	1	60	Clay and salts------	6	120
Sand and salts------	6	66			
Sand----------	4	70			

For detailed log, see p. 187, U.S. Geol. Survey Bull. 1045-E.

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

25S/43E-35B1 and 35B2. U.S. Geological Survey, well GS-15. Altitude about 1,616 ft. 10- and 3½-inch casing.

Salts and minor quantities of clay	23	23	Sand	3	100
Salts	6	29	Salts	2	102
Sand	2	31	Salts, clay, and sand	3	105
Salts, sand, and minor quantities of clay	35	66	Salts and sand	5	110
Sand	3	69	Salt and clay	6	116
Salts and sand	17	86	Sand	2	118
Sand	5	91	Clay, sand, and salts	14	132
Clay and salts	6	97	Sand	4	136
			Clay and salts	4.3	140.3

For detailed log, see pl. 7, U.S. Geol. Survey Bull. 1045-E.

25S/43E-35D1 and 35D2. U.S. Geological Survey, well GS-16. Altitude about 1,616 ft. 10- and 3½-inch casings.

Salts with minor quantity of clay	26	26	Sand and salts	5	97
Salts and sand	36	62	Salts and sand	15	112
Sand	8	70	Clay, sand, and salt	8	120
Clay and salts	13	83	Sand	3	123
Sand and salts	6	89	Clay, salt, and some sand	7	130
Clay and salts	3	92			

For detailed log, see pl. 7, U.S. Geol. Survey Bull. 1045-E.

25W/43E-36B1 and 36B2. U.S. Geological Survey, well GS-13. Altitude about 1,616 ft. 10- and 3½-inch casings.

Salt and clay	22	22	Salts, sand, and clay	13	95
Salts and sand	5	27	Salts and sand	13	108
Sand	3	30	Sand, clay, and salts	7	115
Salts and sand	36	66	Clay and salts	7.2	122.2
Sand	5	71			
Clay and salts	11	82			

For detailed log, see pl. 7, U.S. Geol. Survey Bull. 1045-E.

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)

25S/43E-36D1 and 36D2. U.S. Geological Survey, well GS-14. Altitude about 1,616 ft. 10- and 3½-inch casings.

Salts and clay------	23	23	Sand and salts------	5	93
Salts and sand------	41	64	Clay and salts------	2	95
Sand----------	8	72	Clay, sand, and salts----------	21	116
Clay and salts------	12	84	Sand----------	4	120
Sand----------	2	86	Clay and salts------	5.4	125.4
Clay and salts------	2	88			

For detailed log, see p. 227 and pl. 7, U.S. Geol. Survey Bull. 1045-E.

25S/44E-30E1 and 30E2. U.S. Geological Survey, well GS-6. Altitude about 1,618 ft. 10- and 3½-inch casing.

Salts and clay------	23	23	Clay, sand, and salts----------	10	79
Salts with some sand and clay-----	8	31	Salts and sand------	10	89
Salts and sand------	19	50	Clay, sand, and some salts--------	9	98
Sand----------	5	55	Clay with salts and sand----------	9.2	107.2
Clay with some salts	14	69			

For detailed log, see pl. 7, U.S. Geol. Survey Bull. 1045-E.

25S/44E-30N1 and 30N2. U.S. Geological Survey, well GS-11. Altitude about 1,618 ft. 10- and 3½-inch casings.

Salts and clay------	20	20	Salts and sand------	4	93
Salts and sand------	14	34	Salts, clay, and sand----------	5	98
Salts, sand, and some clay---------	15	49	Sand----------	2	100
Salts and sand------	19	68	Salts and sand------	7	107
Sand----------	4	72	Clay and salts------	4	111
Clay with some salts	12	84	Sand----------	4	115
Salts and sand------	1	85	Clay and salts------	2	117
Salts and clay------	4	89	Sand----------	3	120
			Clay and salts------	4.8	124.8

For detailed log, see p. 199 and pl. 7, U.S. Geol. Survey Bull. 1045-E.

25S/44E-31K1 and 31K2. U.S. Geological Survey, well GS-22. Altitude about 1,620 ft. 16- and 3½-inch casings.

	Thickness (feet)	Depth (feet)
Salts with some sand and clay	5	5
Clay	11	16
Salts and clay	2	18
Salts and sand	33	51
Sand	6	57
Clay, salts with some sand	16	73
Sand with salts and clay	4	77
Salts and sand with some clay	15	92
Sand and clay	7	99
Clay with some salts and sand	6.4	105.4

For detailed log, see p. 278 and pl. 8, U.S. Geol. Survey Bull. 1045-E.

26S/43E-2M1 and 2M2. U.S. Geological Survey, well GS-12. Altitude about 1,618 ft. 16- and 3½-inch casings.

	Thickness (feet)	Depth (feet)
Clay	25	25
Salts and clay	6	31
Salts and sand	45	76
Clay with some salts	12	88
Sand with some salts	3	91
Clay and salts	3	94
Sand and salts	3	97
Sand	3	100
Clay and salts	2	102
Sand, clay, and salts	19	121
Sand	3	124
Clay and salts	2.6	126.6

For detailed log, see p. 214 and pl. 7, U.S. Geol. Survey Bull. 1045-E.

26S/43E-6F2. Stauffer Chemical Co., well 2. Altitude about 1,660 ft. 14-inch casing 0-139 ft and 6-inch casing 139-204 ft. 6-inch casing was pulled after completion. Perforated 82-135 ft.

	Thickness (feet)	Depth (feet)
Soil, gravelly	32	32
Clay, white	9	41
Mud, black, and rock	1	42
Rock, broken, and muck	40	82
Gravel, coarse and clean	2	84
Gravel with layers of mud	8	92
Clay, gray	3	95
Gravel and clay	14	109
Clay and gravel, solid	43	152
Clay, green-gray	11	163
Clay, dark with gravel, solid	41	204

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
26S/43E-11N1 and 11N2. U.S. Geological Survey, well GS-23. Altitude about 1,627 ft. 16- and 2½-inch casings.					
Clay	32	32	Sand and clay with some salts	6	72
Sand with small quantity of salts	12	44	Sand	3	75
Clay with some salts	17	61	Clay with salts and some sand	3	78
Sand	2	63	Clay	4.1	82.1
Clay and salts	3	66			
For detailed log, see p. 294 and pl. 8, U.S. Geol. Survey Bull. 1045-E.					
26S/43E-13K1. U.S. Geological Survey, well GS-7. Altitude about 1,621 ft. 16-inch casing.					
Clay	32	32	Clay and salts	6	82
Salts and clay	3	35	Sand and clay with some salts	9	91
Sand and salts	17	52	Clay and salts	4.5	95.5
Clay and salts	22	74			
Sand	2	76			
For detailed log, see p. 175 and pl. 7, U.S. Geol. Survey Bull. 1045-E.					
27S/42E-24M1. American Potash and Chemical Corp., well 28. Altitude about 1,955 ft. 18-inch casing.					
"Top soil"	1	1	Sand and gravel with cemented streaks	46	154
Sand, with streaks of sandstone, cemented	10	11	Rock or boulder, hard	5	159
Sand and rock, cemented	35	46	Sand and gravel, cemented	13	172
Sand and gravel, cemented	54	100	Sand, gravel, and boulders, cemented	43	215
Sand and gravel, loose	8	108	Boulder, hard	1	216
			Rock, cemented	39	255
			Clay, red	1	256

28S/43E-12A1. U.S. Navy. Altitude about 2,400 ft. Drilled by Evans Bros. Drilling Co. 8-inch casing 0-498 ft., perforated 307-498 ft.

	Thickness (feet)	Depth (feet)
Gravel and clay-----	40	40
Boulders and gravel-	30	70
Rock----------	10	80
Clay and small boulders----------	35	115
Rock, sand, and gravel----------	14	129
Clay and gravel-----	27	156
Rock and gravel-----	1	157
Rock----------	2	159
Clay and gravel-----	12	171
Boulders----------	3	174
Clay and gravel-----	7	181
Boulders----------	4	185
Clay----------	5	190
Boulders----------	2	192
Clay----------	10	202
Boulders----------	10	212
Clay----------	4	216
Boulders----------	2	218
Clay----------	4	222
Boulders and clay---	10	232
Boulders----------	10	242
Clay, sandy---------	8	250
Boulders and sandy clay----------	7	257
Boulders, small-----	3	260
Clay----------	3	263
Boulders, small-----	22	285
Clay----------	14	299
Boulders and clay---	31	330
Clay and boulders---	13	343
Clay----------	2	345
Boulders----------	2	347
Clay----------	4	351
Boulders----------	10	361
Clay and boulders---	6	367
Gravel----------	2	369
Clay and small boulders----------	21	390
Boulders and gravel-	8	398
Clay----------	17	415
Boulders----------	35	450
Clay, sandy---------	20	470
Boulders, small-----	10	480
Gravel----------	2	482
Clay----------	12	494
Boulders and gravel, small----------	4	498

28S/44E-8C1. U.S. Navy. Altitude is 2,375.0 ft. Drilled by Evans Bros. Drilling Co. 10-inch casing, perforated 250-320 and 435-445 ft.

	Thickness (feet)	Depth (feet)
Sand and small rocks----------	15	15
Sand, hard----------	7	22
Sand and boulders---	5	27
Sand----------	4	31
Boulders and sand---	213	244
Clay----------	4	248
Sand and boulders---	37	285
Sand with streaks of clay----------	23	308
Sand and boulders---	4	312
Sand, hard----------	4	316
Clay and sand-------	264	580
Sand----------	86	666
Sand and clay-------	21	687
Rock----------	3	690

TABLE 4.--*Chemical analyses of water*

[All values have been rounded to cooform to Geological Survey standards]

Units of expression: The concentrations of chemical constituents are expressed in milligrams per liter (mg/l) for dissolved-solids content of concentrations less than 7,000. For concentrations greater than 7,000, the constituents are reported in parts per million (ppm).
Calcium: Values preceded by the letter a indicate calcium is reported as calcium oxide.
Magnesium: Values preceded by the letter b indicate magnesium is reported as magnesium oxide.
Sodium: Values preceded by the letter c indicate a combination of sodium and potassium.
Boron: Values preceded by the letter d indicate boron is reported as borate.

Analyzing laboratory and sample number: APC, American Potash and Chemical Co.; DA, University of Arizona, Agricultural Experiment Station, Department of Agricultural Chemistry and Soils; DGT, Thompson (1929); DWR, California Department of Water Resources; GS, U.S. Geological Survey; S, Stauffer Chemical Co.; SE, Smith-Emery Laboratory; USN, U.S. Navy laboratory.

Well number	Date of collection	Depth of well (feet)	Water temperature (°C)	Results in milligrams per liter (mg/l) except as noted above																				Percent sodium	Specific conductance (micromhos at 25°C)	pH	Analyzing laboratory and sample number
				Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids: Calculated (Sum of determined constituents)	Dissolved solids: Residue on evaporation at 180°C	Hardness as $CaCO_3$	Noncarbonate hardness as $CaCO_3$						
U.S. Public Health Service drinking-water standards (1962)					0.3							250	250	0.9	45		500	500									
19S/41E-16G1	3- 9-55				0	44	12	48	5.2	178	0	76	29	0.8	6.9	0.50	310	335	160		39	504	7.6	DWR-5541
	1-24-57		19	60	0	42	14	48	5.4	156	7	76	30	1.4	3	.56	364	380	162		38	518	8.3	DWR-7686
	3-30-60			57		43	12	48	5.1	174	0	73	27	.8	6.2	.27	358	358	155		39	510	7.6	DWR-R3176
16G2	4- 9-54		18			83	18	129	5.8	208	0	268	84	.5	8.7	1.65	701	754	281		49	1,100	7.4	DWR-P519
19S/42E-31LS1	4-19-56		17			56	16	35	1.5	159	0	72	28	.2	53	.32	340	352	206		27	547	7.7	DWR-R1111
31MS1	4-19-56		16			72	14	25	1.6	177	0	109	21	.3	15	.20	345	393	324		19	602	7.0	DWR-R1103
20S/42E-6AS1	4- 9-54		16			75	14	35	1.0	215	0	90	32	.6	2.5	.35	356	440	245		24	632	7.5	DWR-P508
20S/44E-10DS1	4-10-54		16			164	55	34	12	275	0	456	19	.6	1.2	.12	877	1,080	635		10	1,200	7.9	DWR-P541
25PS1	9-12-67		22			75	32	11	3.5	234		138	11	.5	0		386	419	319		1	606	8.0	DWR-R1991
21S/43E-25C1	3-15-55					65	29	148	12	151	0	159	230	.7	12	.54	730	782	282		52	1,200	7.4	DWR-5419
	3-31-60			73		96	45	162	14	146	0	123	367	.9	15	.50	968	1,120	425		44	1,590	7.9	DWR-R3172
	4-20-61			90		93	48	180	17	151	0	165	376	.6	23	.69	1,070	1,150	430	304	47	1,740	7.4	DWR-12554
21S/44E-10LS1	11-30-53					77	46	675	28	176	0	380	930	2.5	0	1.6	2,230	2,100	382		78	3,520	7.7	DWR-3766
	2-10-55		22			80	39	592	30	159	0	327	859	2.4	0	1.5	2,000	2,000	365		76	3,510	7.7	DWR-5418
	12-17-66					68	39	500		181	0	260	708		1	1.15		1,760	332		77	2,850	7.9	DA-3123
	3-18-67					69	40	492		176	0	300	676				1,660	1,750	337			2,750	7.6	DA-682
	6-29-67					72	39	518		195	0	310	700				1,740	1,830	340		77	2,800	7.5	DA-1906
	9-20-67					72	39	531		185	0	320	720				1,770	1,870	340		77	2,600	7.6	DA-2683
	12-28-67					48	48	392		171	0	300	684					1,640	316		73	2,800	7.8	DA-1
27M1	3-31-60		26	7		56	29	71	10	104	0	248	46	1.7	1.4	.19	521	518	260		36	763	7.6	DWR-R3208
22S/42E-14DS1	3-22-67		18			110	66	128	3	296		384	109	1.1	6	.68	954	943	544	302	34	1,320	7.9	DWR-R1780
22S/44E-10D1	2-10-55					138	50	304	16	132	0	509	433	.5	0	.44	1,520	1,570	550		54	2,430	7.4	DWR-5416
22S/45E-29GS1	4-10-55		11			176	33	24	5.7	326	0	406	20	0	2.7	.13	829	720	575		8	1,070	7.5	DWR-R626

Well number	Date of collection	Depth of well (feet)	Water temperature (°C)	Results in milligrams per liter (mg/l) except as noted above																			Analyzing laboratory and sample number
				Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids: Calculated (Sum of determined constituents)	Dissolved solids: Residue on evaporation at 180°C	Hardness as $CaCO_3$	Noncarbonate hardness as $CaCO_3$	Percent sodium	Specific conductance (micromhos at 25°C)	pH	
U.S. Public Health Service drinking-water standards (1962)					0.3							250	250	0.9	45		500	500					
22S/45E-29H1	4-10-55		9			183	34	27	5.7	220	0	448	21	0	2.5	0.13	829	898	597		9	1,020	7.6	DWR-R628
23S/42E-20DS1	8-25-59			22		52	16	28	2.5	227	0	21	34	.1	13	.26	301	379	196		24	522	7.4	DWR-T4055
25M1	3-22-67					62	17	39	3	267		24	39	.4	8.5	.25	325	342	223	4	27	531	7.7	DWR-R1782
25QS1	11-29-56					54	9	64	2.9	180	0	40	69	.4	47	0	375	400	172		44	677	7.7	DWR-R1359
	3-23-67					52	13	63	4	174		46	70	.4	40	.56	375	414	182	39	42	606	7.9	DWR-R1783
34AS1	4-12-54		16			68	16	65	2.5	277	0	64	50	.3	16	.35	418	420	236		37	718	7.8	DWR-P521
23S/43E-28A1	2-27-53	672						291			175	47	206			d3.9	723	598	118					APC
	2-27-53	705						303			175	46	224			d3.9	753	660	120					APC
	2-27-53	735						460			278	55	334			d16	1,140	758	165					APC
	10-23-53	671						239			49	47	211			d2.7	549	546	123					APC
	10-23-53	706						222			52	39	249			d2.7	565	616	132					APC
	10-23-53	735						286			44	57	345			d2.8	733	768	151					
31D1	3-23-67					58	19	52	3	273		40	42	.4	2.5	.33	351	296	221	0	33	567	7.7	DWR-R1779
31DS1	4-12-54					39	12	46	3.6	176	0	35	38	.4	17	.30	278	318	147		40	488	8.1	DWR-P525
31G1	8-23-39																	404						APC
23S/44E-3N1	4-14-53		25			1,590	1,650	98,600	372	514		2,680	159,000	1.3	124	188	264,000	272,000	8,090		95	214,000	7.5	GS
4G1	8-29-67		24			265	320	6,620	328	256		168	11,800	0	5	18	19,600	22,100	1,980		86	28,800	7.8	DWR-1992
24S/42E-2DS2	3-15-67		16			40	8.5	29	1.5	117		30	44	1.1	14	.25	226	192	135	39	32	378	7.7	DWR-R1781
3AS1	4-12-54		16			63	11	46	2.5	235	0	30	51	1.8	3.1	.55	325	321	203		33	600	7.6	DWR-P518
12QS1	2-18-67		20			21	6	31	2	69	15	16	29	.3	9	.22	164	208	76	0	46	301	8.8	DWR-R1737
26BS1	11-29-56					55	12	59	2.8	275	0	27	46	.4	5.6	.46	343	375	187		40	645	7.6	DWR-R1360
24S/43E-7J1	5-22-37															d5.3								APC
7MS1	2- 9-67		26			35	7	31	1	81	19	22	38	.3	12	.26	206	243	116	18	37	374	8.8	DWR-R1743
7P1	5-15-36					a47	b9	73			60	20	27				236		154					APC
9P1	7-26-63		58			a3.6	b.7	20,300			1,080	8,520	23,500			d571	53,900		11		100			APC

Well number	Date of collection	Depth of well (feet)	Water temperature (°C)	Results in milligrams per liter (mg/l) except as noted above																				Analyzing laboratory and sample number
				Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids: Calculated (Sum of determined constituents)	Dissolved solids: Residue on evaporation at 180°C	Hardness as $CaCO_3$	Noncarbonate hardness as $CaCO_3$	Percent sodium	Specific conductance (micromhos at 25°C)	pH	
U.S. Public Health Service drinking-water standards (1962)					0.3							250	250	0.9	45		500	500						
24S/43E-14L1	5-18-33					a58		379			57	122	425			d7	1,050		145					APC
	3-15-54					26	14	228	20	169	0	91	287	0.3	18	.85	768	790	122		77	1,430	7.5	DWR-P479
18MS1	7-11-55		33			28	7	28	.6	81	0	22	45	.6	7.4	.24	179	210	99		38	323	7.4	DWR-5959
	4-10-56		23			26	5	39	.6	95	0	29	48	.9	2.5	.08	198	234	86		50	370	6.9	DWR-R1122
21J1	5- 3-33							2,890			136	1,040	3,500			d77	7,640							APC
	2-29-40							4,270			176	2,320	4,600			d113	11,500							APC
	12-19-50							1,800			193	744	1,940			d108	4,780							APC
	6- 5-53		28			1.8	1.1	774	24	284	22	272	814	1.3	9.3	5.6	2,070	2,120	9		98	3,690	9.2	DWR-P693
	12- 2-60							4,810			2,260	1,350	3,700			d77	12,200							APC
	6-19-63											1,150	3,220				4,370							APC
21J2	5-13-17	150						653			179	166	119			d31	1,150	1,640						APC
	5-13-17	190						604			175	146	603			d31	1,560	1,520						APC
	5-20-17	240						820			192	218	851			d55	2,140	2,100						APC
	7- 8-29							1,260		250	26	237	1,560			d47	3,380							APC
22G1	9-23-63					a2.9	b.5	1,020			130	176	1,270			d31	2,630		9		100		9.3	APC
22M1	9- 3-37							2,980			77	901	3,800			d81	7,840							APC
	8- 1-41							2,880			108	960	3,570			d78	7,600							APC
	8-20-45	297						639	32		161	183	678			d25	1,720							APC
	12-19-50							1,190			187	1,560	418			d108	3,460							APC
	6-15-55							4,390			193	1,890	5,100			d116	11,700							APC
	12- 2-60							4,880			226	2,100	5,640			d154	13,000							APC
	3-14-62		32	15		22	14	4,230	47	470	30	1,350	5,000	1.3	12	39	11,000	11,500	112	0	97	15,000	8.3	DWR-R4344
	6-19-63							4,490				1,890	5,520				11,900							APC
22M2	7- 1-44							2,300			12	679	3,040			d3.9	6,030							APC
	12-19-50							3,400			164	1,280	4,060			d100	9,000							APC
	6-15-55							1,830			158	609	2,180			d4.7	4,780							APC
	12- 2-60							4,480			170	3,040	4,430			d77	12,200							APC
	6-19-63							4,000				1,690	4,910				10,600							APC
22N1	6- 7-51							2,760			164	1,020	3,280			d77	7,300							APC
	1- 2-55							2,460			170	947	2,850			d77	6,500							APC
	6-15-55							2,460			170	879	2,910			d70	6,490							APC
	12- 2-60							2,160			170	744	2,550			d77	5,700							APC
	3-14-62		26	24		5	4	2,340	47	302	60	867	2,770	1.1	12	25	6,300	6,300	29	0	98	9,500	8.7	DWR-R4342
	6-19-63							2,320				744	3,030				6,090							APC
22N2	11- 1-39							3,000			89	891	3,820			d71	7,870							APC
	7- 2-43							3,040			119	987	3,780			d75	8,000							APC
	2- 5-48							2,580			147	927	3,090			d62	6,810							APC
	12-19-50							2,990			170	1,150	3,520			d85	7,910							APC

Well number	Date of collection	Depth of well (feet)	Water temperature (°C)	Results in milligrams per liter (mg/l) except as noted above																			Analyzing laboratory and sample number
				Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids: Calculated (Sum of determined constituents)	Dissolved solids: Residue on evaporation at 180°C	Hardness as $CaCO_3$	Noncarbonate hardness as $CaCO_3$	Percent sodium	Specific conductance (micromhos at 25°C)	pH	
U.S. Public Health Service drinking-water standards (1962)					0.3							250	250	0.9	45		500	500						
24S/43E-22N3	6-24-29							1,020		196	36	284	1,190			d31	2,660							APC
	5- 3-33							985			130	270	1,150			d23	2,560							APC
	6- 6-35							1,270			125	376	1,520			d35	3,330							APC
	6- 3-37							1,260			126	361	1,520			d35	3,300							APC
	8- 1-39							1,620			127	527	1,940			d46	4,260							APC
23M1	4-11-17	290						703		150		156	783			d17	1,810	1,780						APC
	6-28-29							727		210	51	156	819			d12	1,880							APC
32L1	6- 7-51							3,320			272	1,490	3,640			d116	8,840							APC
	6-15-55							5,310			306	2,370	6,010			d162	14,200							APC
	1-11-61							10,800				5,280	12,400			d193	28,700							APC
	7- -61							3,620					5,580				9,200							APC
	6- -62							1,770					2,730				4,500							APC
	6-19-63							1,360				541	1,700				3,600							APC
24S/45E-11MS1	4-10-56		19			44	19	74	11	189	0	130	52	0.6	5.3	.95	430	482			44	726	7.2	DWR-R1123
25S/43E-3L1	11-26-14		7					15,000	577	0	10,300	1,420	9,900			d1,160	38,400	39,100						APC
	1-14-15		20					15,300	420	0	11,200	1,150	9,300			d1,160	38,500	38,800						
9E1	8-14-67		30			0	0	36,600	1,050	37,000	7,860	4,210	23,400	90	0	360	91,800	94,100	0		98	76,000	9.2	DWR-1994
17D1	7- 1-42							17,300	356		1,790	7,400	19,200			d590	46,600							APC
	8-20-45							17,800	397		1,720	7,520	19,900			d593	47,900							APC
	12- 3-47							19,100			1,800	7,930	21,100			d617	50,500							APC
	7- 7-51							19,500			1,760	8,250	21,600			d625	51,700							APC
	6-15-55							20,000			1,870	8,390	22,100			d633	53,000							APC
	12- 2-60							23,300			1,470	9,810	26,600			d695	61,900							APC
	6-19-63							18,200				8,300	22,000				48,500							APC
17D2	12- 2-60							25,500			1,020	5,550	33,600			d849	66,500							APC
	12- -61							21,600					33,200				54,800							APC
	3-14-62		26	12		0	50	22,800	332	2,590	0	1,230	33,600	3	5.6	278	59,600	82,000	206	0	99	55,000	8.1	DWR-R4343
	6- -62							14,000					21,500				35,500							APC
	12- -62							22,000					33,800				55,800							APC
	6- -63							27,400				12,500	30,000				69,900							APC
17D3	1- 9-42							28,800	0		827	10,200	27,900			d671	68,400							APC
	7- 1-42							20,100	2,800		711	8,770	25,900			d580	58,900							APC
	1- 2-43							23,600			744	10,200	27,800			d636	63,000							APC
	7- 2-43							20,400	0		698	8,700	23,900			d584	54,300							APC
	1- 1-44							24,600	0		801	10,600	28,900			d676	65,600							APC
	7- 1-44							19,900	0		652	8,690	23,200			d567	53,000							APC

Well number	Date of collection	Depth of well (feet)	Water temperature (°C)	Results in milligrams per liter (mg/l) except as noted above																				Analyzing laboratory and sample number
				Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids: Calculated (Sum of determined constituents)	Dissolved solids: Residue on evaporation at 180°C	Hardness as $CaCO_3$	Noncarbonate hardness as $CaCO_3$	Percent sodium	Specific conductance (micromhos at 25°C)	pH	
U.S. Public Health Service drinking-water standards (1962)					0.3							250	250	0.9	45		500	500						
25S/43E-17D4	8-20-45							7,500	209		344	3,340	8,770			d248	20,400							APC
	12- 3-47							5,000			340	2,090	5,700			d147	13,300							APC
	6- 7-51							13,800			425	5,950	16,200			d370	36,700							APC
	1-15-55							15,500			487	6,760	18,200			d417	40,900							APC
17D6	7- 1-42							27,000	426		982	11,600	32,000			d769	72,800							APC
	1-28-47							17,900	0		790	7,600	20,800			d529	47,600							APC
	6-15-55							20,800			1,020	9,000	24,000			d602	55,400							APC
	12- 2-60							21,500			1,240	9,060	24,700			d617	57,100							APC
	6-19-63							27,400				12,400	33,000				72,800							APC
22B1	8-15-67		28			0	0	152,000	17,600	976	40,100	56,700	155,000	30	0		422,000	420,000	0		94	139,000	9.4	DWR-R1995
31N1						10	5	1,670			203	677	1,810			d59	4,430							S
25S/44E-23L1	1- 9-67		13			232	94	214	9	235		708	313	.8	3	3.0	1,690	1,940	968	776	32	2,530	8.2	DWR-R1676
25S/45E-29K1	1- 8-67		9			306	27	73	5	198		637	139	.6	1.5	.8	1,290	1,380	875	713	15	1,780	8.2	DWR-R1679
29R1	1- 8-67		12			496	146	281	10	221	19	1,550	366	1.1	12	2.8	2,990	3,330	1,840	1,630	25	3,710	8.3	DWR-R1677
26S/43E-13K1	2-18-55					12	1	138,000	5,500	4,150	24,500	30,500	166,000		174	1,200	368,000	370,000	34		98	161,000	9.0	DWR-5417
15M1	8-17-67		23			0	0	92,000	2,930	5,850	19,000	13,300	110,000	50	0	126	240,000	246,000	0		98	142,000	9.3	DWR-1993
22A1	8-17-67		22			0	0	101,000	3,900		69,300	28,300	63,500	90	0		266,000	274,000	0		98	122,000	9.4	DWR-R1996
26S/45E-21J1	1-11-18			62	0.12	125	27	c184		429	0	176	180		.5		966	962	423					DGT-490
22N1	1-11-18			64	.13	109	18	c76		332	0	128	75		Trace		634	652	346					DGT-471
26S/47E-20QS1	1-12-18		16	74	.21	50	21	c36		183	0	55	52		12		390	446	211					DGT-488
	1- 7-67					32	18	39	7	173		35	38		18		272	464	156	14	34	490	8.3	DWR-R1680
28S/43E-6B1	7-20-50			19	Trace	8	1.3	4,490		2,730	288	2,270	3,330			193	11,900		25		100	18,000	9.0	SE-324431
12A1	12-12-50			4.7	Trace	22	4.6	154		177	0	96	115			1.6	485	572	73			750	7.8	SE-330257
28S/44E-8C1	9-15-64			48	.7	24	6.8	116	6	271	4.8	52	40	.7		.61	438	389	88		73	555	8.2	USN
	5-16-66			62	0	30	5.9	100	6.1	256		45	38	.5	15	.3	429	460	100		67		7.8	USN
	9- 8-66			58	0	26	1.9	122	6.6	261		47	38	.6	16	0	445	484	72		77		7.5	USN
28S/47E-7N1	1- 7-67		9			12	7	510	12	967	60	132	96	6.5	1.9	2.8	1,320	1,510	60	0	93	2,190	8.8	DWR-R1678

TABLE 5.--*Pumping tests*

Source of data: AP&CC, American Potash and Chemical Co.; D, driller; DGT, Thompson (1929); DWR, California Department of Water Resources; GS, U.S. Geological Survey; H-N, Holmes & Narver, Engineers, Los Angeles, Calif.; P, Pump company.

Depth of well: The depth shown is the depth of the well, in feet, reported by the person making the test.

Pumping rate: The pumping rate, reported in gallons per minute (gpm), does not necessarily indicate the maximum capacity of the well, but is the rate at which the well was pumped at the time of the test.

Static water level: The static, or standing, water level is the reported depth to water at the time of the test. If the static water level was not measured prior to the test, the pumping water level has been shown and footnoted.

Drawdown: The drawdown is the difference, in feet, between the static water level and the pumping water level.

Specific capacity: The specific capacity is a measure of the physical condition of the well and the aquifer or aquifers which it penetrates. A well with a large specific capacity is capable of a greater yield than a well with a small specific capacity. Specific capacity is obtained by dividing the pumping rate, in gallons per minute, by the drawdown, in feet, after an extended period of pumping.

Well number	Source of data	Depth of well (feet)	Date tested	Pumping rate (gpm)	Static water level (feet)	Drawdown (feet)	Specific capacity (gpm/ft of dd)
21S/43E-25C1	DWR	82	1-28-55	35	62		
23S/43E-31C1	AP&CC	57	1936	20			
	AP&CC	57	1943	14			
31G1	AP&CC	65	1936	24	40		
	AP&CC	65	1943	28			
	GS	62.1	1-25-67	a20	b51.27		
23S/44E-3N1	GS	285	4-14-53	18	14.30	9.0	2.0
	GS	285	4-14-53	28	14.30	8.4	3.3
24S/43E-7J1	AP&CC	500	7-25-31	12			
	AP&CC		1936	12			
			1943	6			
7P1	AP&CC		1936	16			
	AP&CC		1943	12			
	AP&CC		1952	18			
9P1	AP&CC	600	7-26-53	400	397	10	40.0
	AP&CC	600	7-26-53	500	397	11	45.5
	AP&CC	600	7-26-53	600	397	14	42.9
14L1	AP&CC			400			
21J1	AP&CC		10- -60	635	b180.8		
	AP&CC		4- -61	530	b183.8		
	AP&CC	264.8	6- -61	490	b179.8		
	AP&CC	264.8	6- -61	775	160.5	28.3	27.3
	AP&CC		5- -62	655	b185.8		
	AP&CC		1- -63	655	164.0	20.8	31.4
	AP&CC	259.8	4- -63	710	165.0	25.8	27.5
	AP&CC		9- -63	710	b191.8		
	AP&CC		3- -64	700	b192.8		
	AP&CC		9- -64	685	169.3	25.5	26.9
	AP&CC		3- -65	710	169.4	24.4	29.0
	AP&CC		9- -65	685	169.8	24.0	28.5
	AP&CC		3- -66	670	171.4	24.4	27.4
	AP&CC		10- -66	680	171.6	25.2	27.0
21J2	DGT	300	1917	350	85.2	40	8.8
	DGT	300	1917	480	85.2		
22G1	D	393.0	9-23-63		194.6		
	D	393.0	9-23-63	110	b204.6	10	11.0
	D	393.0	9-23-63	165	b206.6	12	13.7
	D	393.0	9-23-63	205	b213.6	19	10.8
	D	393.0	9-23-63	255	b220.6	26	9.8
	D	393.0	9-23-63	310	b241.6	47	6.6
	AP&CC	383.5	8- -65	245	198.2	32	7.7
	AP&CC		3- -66	175	202.6	29.6	5.9
	AP&CC		9- -66	170	b238.2		
22M1	AP&CC		10- -60	455	b193.0		
	AP&CC	277	5- -61	675	171.0	46.0	14.7
	AP&CC		6- -61	640	b215.0		
	AP&CC	274.0	4- -62	650	171.8	42.2	15.4
	AP&CC		1- -63	630	173.2	34.8	18.1
	AP&CC		9- -63	600	b207.0		
	AP&CC	270.0	3- -64	690	175.7	38.3	18.0
	AP&CC		9- -64	630	178.8	41.2	15.3
	AP&CC		3- -65	620	179.0	41.0	15.1
	AP&CC		9- -65	600	178.7	30.3	19.8
	AP&CC		3- -66	580	180.6	29.4	19.7
	AP&CC		10- -66	580	181.2	28.8	20.1
22M2	AP&CC	282	10- -60	650	b207.6		
	AP&CC		3- -61	640	b205.6		
	AP&CC		4- -61	650	b205.6		
	AP&CC		6- -61	630	b208.6		
	AP&CC		5- -62	620	b206.6		
	AP&CC		1- -63	620	183.2	25.4	24.4
	AP&CC		9- -63	600	b210.6		
	AP&CC		3- -64	580	b210.6		
	AP&CC		9- -64	515	189.2	23.4	22.0
	AP&CC		3- -65	510	189.2	22.4	22.8
	AP&CC		9- -65	485	189.9	30.7	15.8
	AP&CC	284.6	1- -66	660	191.7	26.9	24.5
	AP&CC		3- -66	660	190.2	29.4	22.4
	AP&CC		10- -66	630	191.0	27.6	22.8
22N1	AP&CC		10- -60	635	b180.8		
	AP&CC		4- -61	530	b183.8		
	AP&CC		6- -61	490	b179.8		
	AP&CC	264.8	6- -61	775	160.5	28.3	27.4
	AP&CC		5- -62	655	185.8		
	AP&CC		1- -63	655	164.0	20.8	31.5
	AP&CC		4- -63	710	165.0	24.8	28.6
	AP&CC		9- -63	710	b191.8		
	AP&CC		3- -64	700	b192.8		
	AP&CC		9- -64	685	160.3	25.5	26.9
	AP&CC		3- -65	710	160.4	24.4	29.1
	AP&CC		9- -65	685	169.8	24.0	28.5
	AP&CC		3- -66	670	171.4	24.4	27.5
	AP&CC		10- -66	680	171.6	25.2	27.0

Well number	Source of data	Depth of well (feet)	Date tested	Pumping rate (gpm)	Static water level (feet)	Drawdown (feet)	Specific capacity (gpm/ft of dd)
24S/43E-22N2	AP&CC		10- -60	485	b182.4		
	AP&CC		4- -61	490	b183.4		
	AP&CC		6- -61	400	156.4	17	23.5
	AP&CC	235.4	4- -62	600	b178.4		
	AP&CC		9- -62	560	b173.4		
	AP&CC		1- -63	480	157.8	11.6	41.4
	AP&CC		9- -63	475	b172.4		
	AP&CC		3- -64	475	b174.4		
	AP&CC		9- -64	455	163.2	12.2	37.3
	AP&CC		3- -65	475	163.2	13.2	36.0
	AP&CC		9- -65	400	164.3	11.1	36.0
	AP&CC		3- -66	400	165.2	11.2	35.7
	AP&CC		10- -66	380	166.0	12.4	30.6
22N3	D	300	11-14-23	400	90		
	AP&CC	300	1927	400			
	AP&CC	300	12-12-34	520	94.16	29.0	17.9
28B1	DGT	65	1917	60	56.7	2	30
32L1	AP&CC		4- -56	170	b110.1		
	AP&CC		4- -61	115	b115.1		
25S/43E-17D1	AP&CC		6- 3-55	503		75	6.7
	AP&CC		10- -60	480	b170.1		
	AP&CC		6- -62	370			
	AP&CC	263.1	11- -62	510	126.4		
	AP&CC		1- -63	480			
	AP&CC		9- -63	420			
	AP&CC		3- -64	440			
	AP&CC		10- -64	392			
	AP&CC		3- -65	385			
	AP&CC		9- -65	385			
	AP&CC		3- -66	390			
	AP&CC		10- -66	450			
17D2	AP&CC	326	1955	500	120	30	16.6
	AP&CC	326	1955	1,020	120	61	16.7
	AP&CC	321.5	10- -60	660	b149.5		
	AP&CC		6- -62	670			
	AP&CC		1- -63	655			
	AP&CC		9- -63	770			
	AP&CC		3- -64	750			
	AP&CC		10- -64	705			
	AP&CC		3- -65	715			
	AP&CC		9- -65	685			
	AP&CC		3- -66	680			
	AP&CC		11- -66	680			
17D3	AP&CC	341	1927	475			
	AP&CC	341		765			
17D4	AP&CC	203	4-16-54	426			
	AP&CC		5-31-55	386			
17D5	AP&CC		9- -66	695			
17D6	AP&CC		6- 3-55	503			
	AP&CC		10- -60	445	b164.1		
	AP&CC		5- -62	415	b163.1		
	AP&CC		1- -63	420	137.8	24.3	17.3
	AP&CC		9- -63	370	140.7	25.4	14.6
	AP&CC		3- -64	345	b163.1		
	AP&CC		9- -64	340	143.8	18.3	18.6
	AP&CC		3- -65	320	143.4	18.7	17.1
	AP&CC		9- -65	275	145.5	16.6	16.6
	AP&CC		2- -66	455	137.8	26.3	17.4
	AP&CC		3- -66	310	143.3		
31M1	D	153.5	3-22-66		95		
	D		3-22-66	309	b120	25	12.4
	D		3-22-66	332	b122	27	12.3
	D		3-22-66	341	b123	28	12.2
	D		3-22-66	349	b124	29	12.0
	D		3-22-66	385	b130	35	11.0
31N1	D	108	8-14-47	475			
26S/43E-6P2	D	204	6- 2-42	500	76	41	12.2
28S/43E-6B1	N-N	430	7-10-50	20	371		
12A1	P	485	12- 7-50	45	276	99	.45
	GS	485	10- 7-52	42	343.6	62.5	.67
28S/44E-8C1	D	690	1- 4-53	550	248		

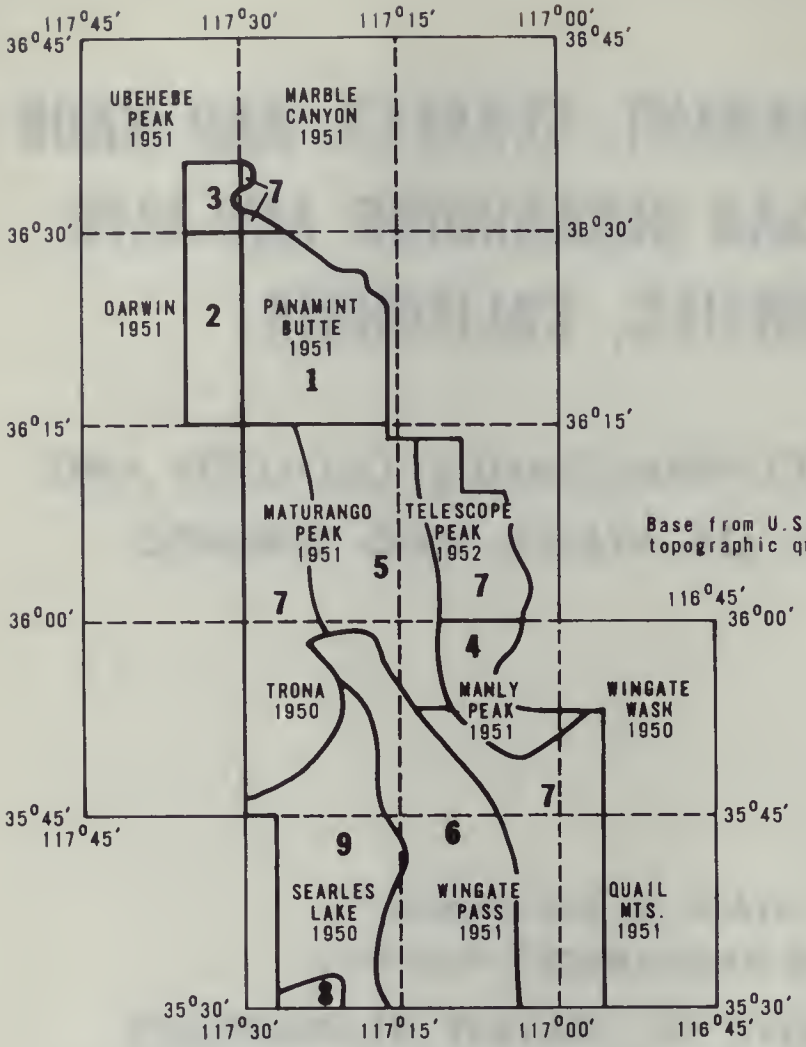
e. Estimated.
b. Well being pumped.

MAPS OF PANAMINT, SEARLES, AND KNOB VALLEYS, SAN BERNARDINO AND INYO COUNTIES, CALIFORNIA

SHOWING RECONNAISSANCE GEOLOGY AND LOCATION OF WELLS AND SPRINGS

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SOUTHERN DISTRICT

FEDERAL-STATE COOPERATIVE
GROUND-WATER INVESTIGATIONS
PREPARED BY U.S. GEOLOGICAL SURVEY
1968



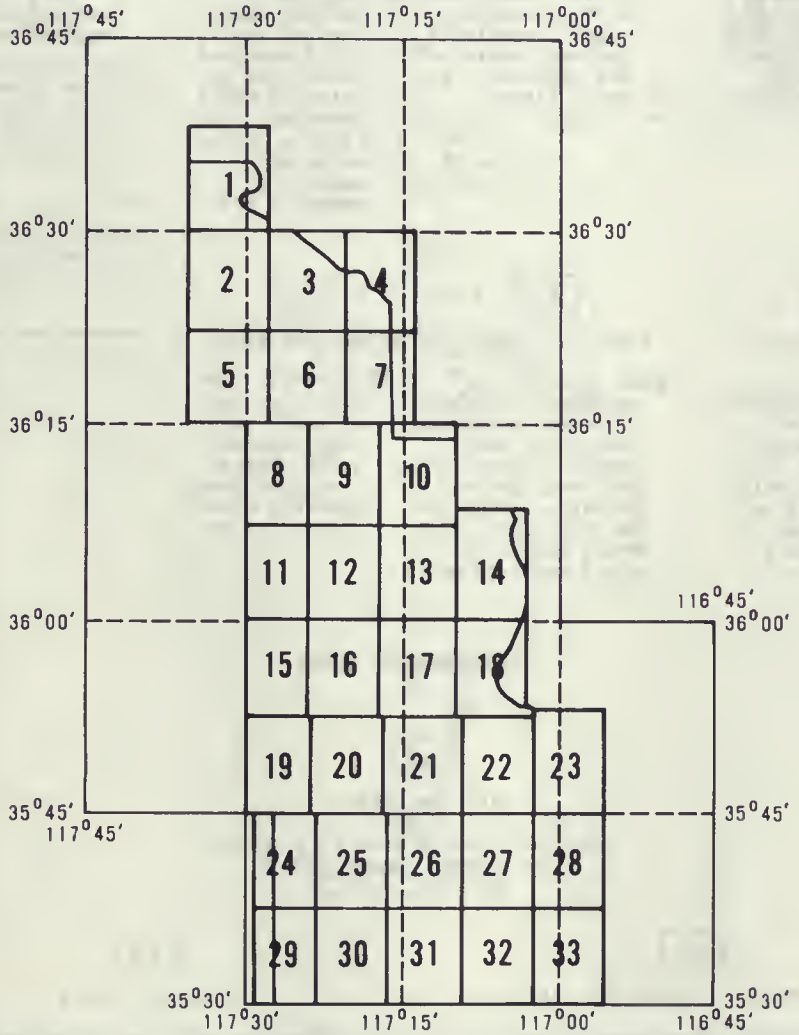
Base from U.S. Geological Survey topographic quadrangles. Scale 1:62,500

INDEX TO TOPOGRAPHIC MAPS AND GEOLOGIC MAPPING

Geology compiled and modified by W.R. Moyle, Jr., from published and unpublished mapping:

1. W.E. Hall and H.G. Stephens (1962)
2. Wayne E. Hall and E.M. MacKevett, Jr. (1962)
3. James F. McAllister (1956)
4. Bradford K. Johnson (1957)
5. Carlos Carranza (unpublished)
6. G.I. Smith, B.W. Troxel, C.H. Gray, Jr., and R. von Huene (unpublished)
7. W.R. Moyle, Jr. (unpublished)
8. G.I. Smith (1964)
9. G.I. Smith (unpublished)

This section consists of explanatory information and 33 page-size maps that show reconnaissance geology and location of wells and springs in the Panamint, Searles, and Knob Valleys. The area covered by each individual map is shown below. A 36- by 48-inch composite of maps 1-14 and a 36- by 48-inch composite of maps 15-33 are available on request, at the requester's expense, from the district chief, U.S. Geological Survey, Water Resources Division, 855 Oak Grove Avenue, Menlo Park, Calif. 94025.



Location of wells and springs by W.R. Moyle, Jr., and Jerry D. Horne

EXPLANATION

UNCONSOLIDATED DEPOSITS

Holocene

Qya — Younger alluvium

Sand, gravel, silt, and clay, unconsolidated. Largely above the regional water table, but where saturated yields water to wells

Qyf — Younger fan deposits

Boulders, cobbles, gravel, sand, and silt, unconsolidated, locally derived. Above the regional water table

Qp — Playa deposits

Clay, silt, and sand, with various quantities of salts. Yield moderate quantities of water to wells where saturated. Locally, water is of poor quality for domestic use

Qs — Windblown sand

Sand, fine to medium, actively drifting. Generally above the regional water table

Pleistocene

Qoa — Older alluvium

Sand, gravel, silt, and clay, moderately well sorted. Where saturated yields water freely to wells. Principal water-bearing unit of fresh water in the north end of Searles Valley

Qof — Older fan deposits

Sand, gravel, and boulders, moderately consolidated and moderately well bedded. Include the Christmas Canyon Formation along the Garlock fault. Where saturated yield water to wells

Qol — Older lake deposits

Clay, silt, sand, tufa, and beds of salt, moderately consolidated. Where saturated yield moderate quantities of brine

QUATERNARY

CONSOLIDATED ROCKS

Qb — Olivine basalt

Olivine basalt. Generally above the regional water table

Pliocene and Pleistocene

QTc — Continental sedimentary rocks

Conglomerate, fanglomerate, and sandstone, moderately to well-bedded. Include the Bedrock Spring Formation south of the Garlock fault. No wells yield water from this unit

QTv — Volcanic rocks

Rhyolite tuff, basalt agglomerate, andesite and basalt flows, with some volcanic breccia, and pyroclastic rocks. Yield small quantities of water in fractured areas

TERTIARY AND QUATERNARY

pTb — Basement complex

Igneous, metamorphic, sedimentary, and metavolcanic rocks, undifferentiated. Impermeable except in fractures, weathered zones, joints, and bedding planes

PRE-TERTIARY

MAP SYMBOLS

Geologic contact

Dashed where approximately located, queried where doubtful

U / D

Fault

Dashed where inferred, dotted where concealed; queried where doubtful. U, upthrown side; D, downthrown side

Surface-water divide between Panamint and Saline Valleys

Geophysical traverse

G1

Industrial well

H1

Domestic or unused well

D1

Dry or destroyed well

KS1

Spring

Long tail indicates length of surface flow in streambed. No spring number indicates no data obtained

GS1

Dry spring

No spring number indicates area of phreatophyte growth for which no spring data wes obtained

WELL-NUMBERING SYSTEM

Letter after well indicates position in section thus:

D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

For e complete description of well-numbering system, see text

APPROXIMATE MEAN DECLINATION 1968

1 0 1 2 3 4 MILES

CONTOUR INTERVALS 40 AND 80 FEET
DATUM IS MEAN SEA LEVEL

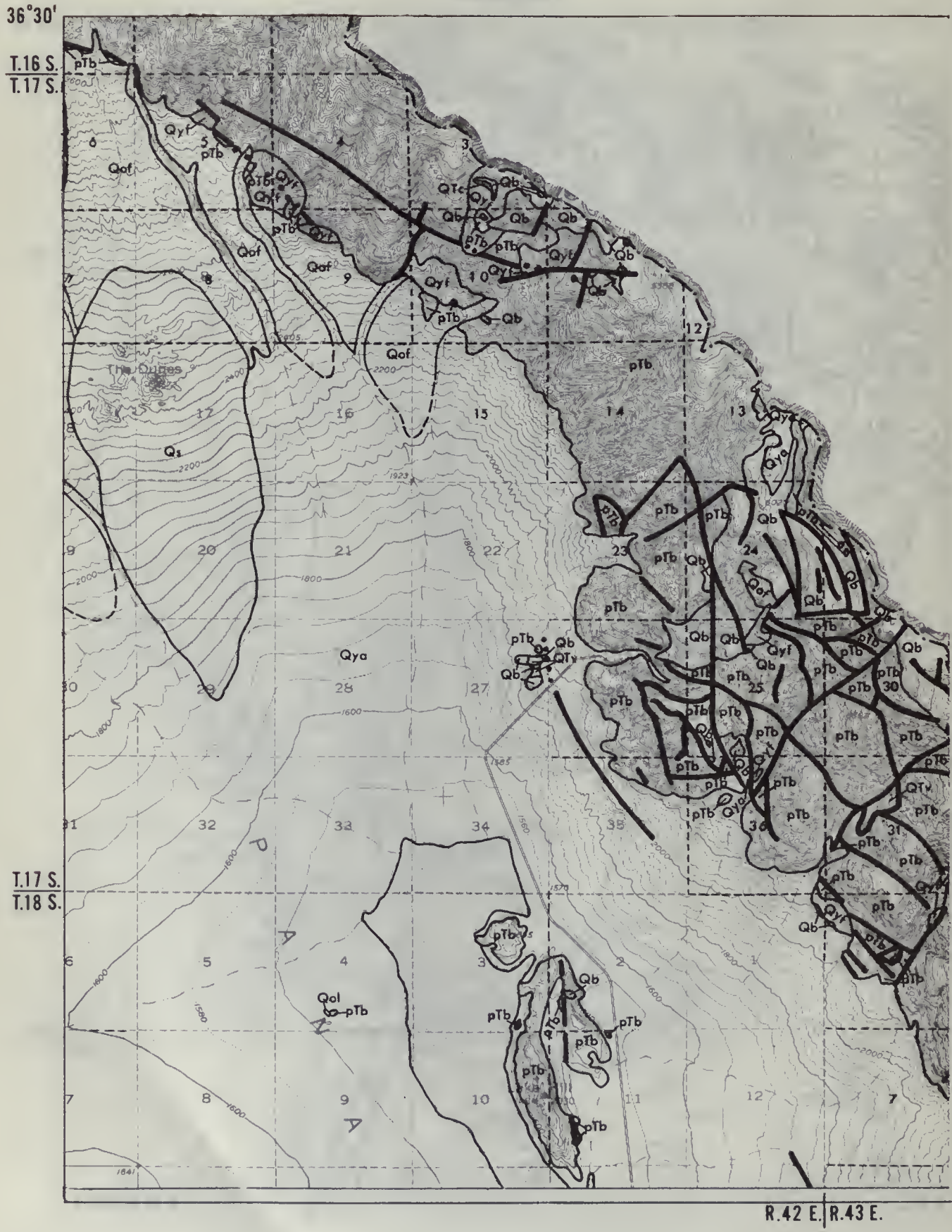
MAP 1


T.16 S.
36°30'
R.41 E.
117°30'
R.41 E.
R.42 E.
HUNTER
MOUNTAIN
Qb
QTv
Qya
Qof
pTb
Jackass Spring
Spring
Springs

MAP 2


36°30'
T.16 S.
T.17 S.
T.17 S.
T.18 S.
R.41 E.
117°30'
R.41 E.
R.42 E.
Qb
QTv
pTb
Qya
Qof
Qyf

MAP 3

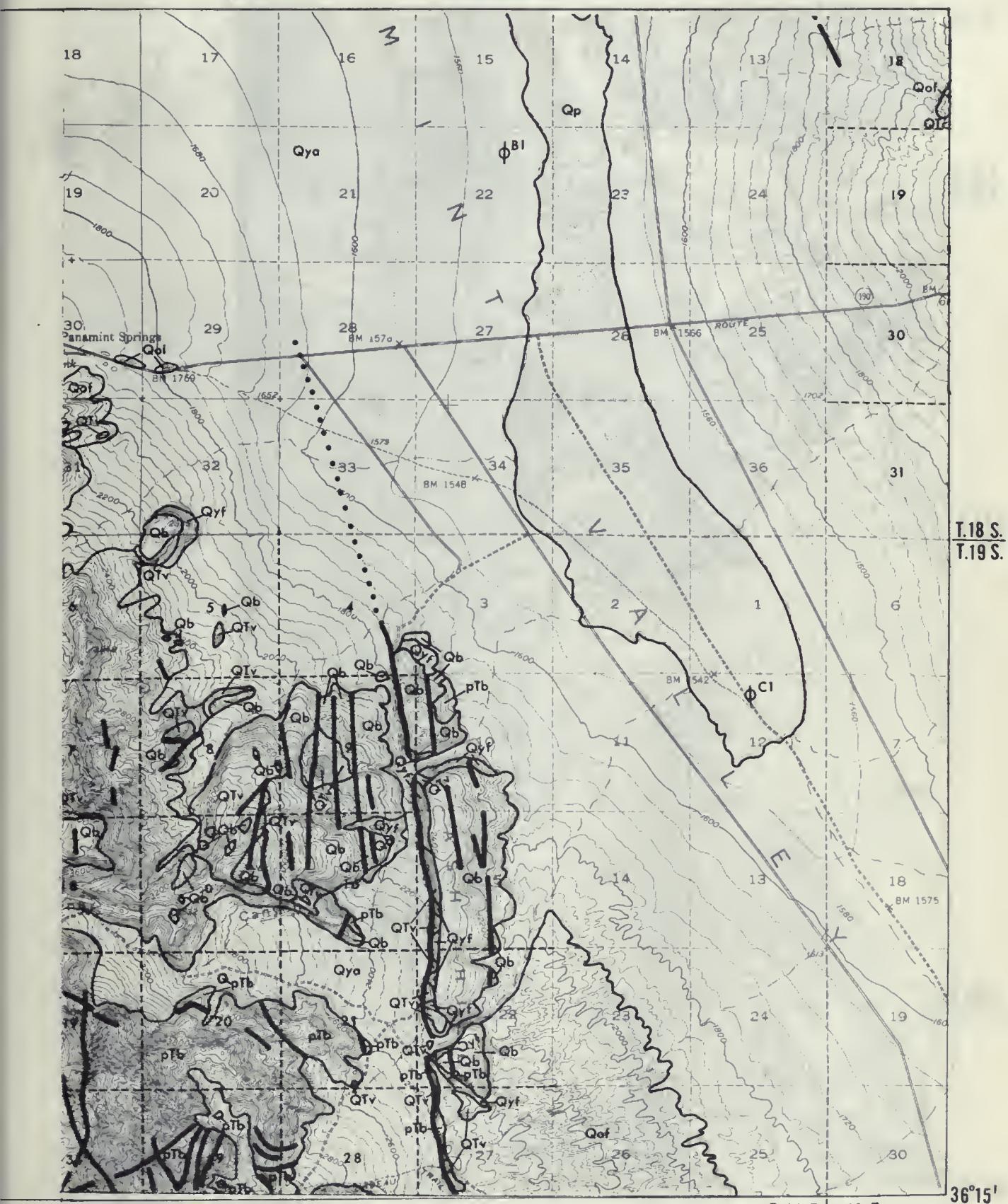

36°30'
T.16 S.
T.17 S.
T.17 S.
T.18 S.
R.42 E.
R.43 E.
pTb
Qyf
Qof
Qb
QTc
QTy
Qya
Qs
Qol
The Dunes
PANAMINT

MAP 4

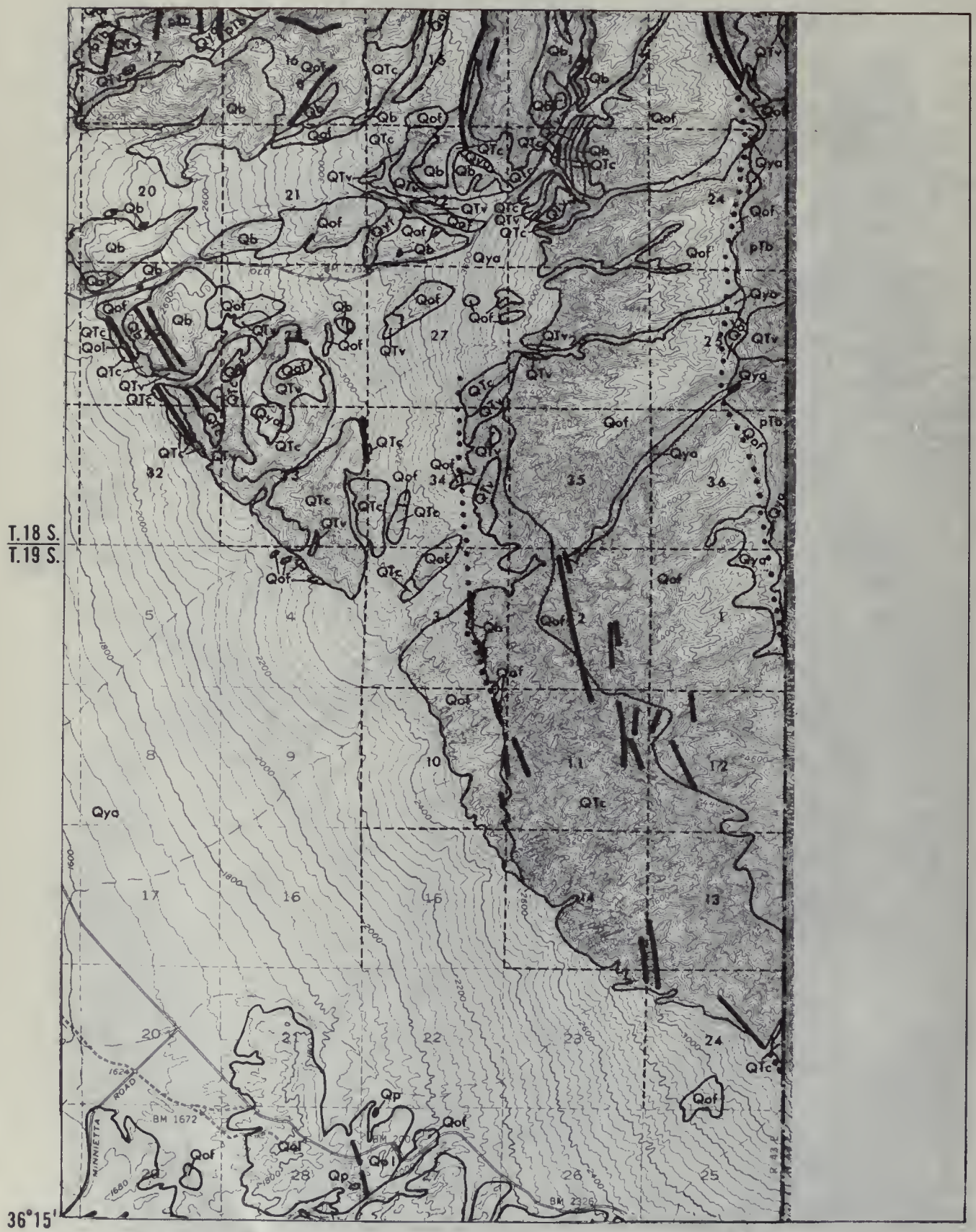
MAP 5


T.18 S.
T.19 S.
36°15'
117°30'
R.41 E.
R 42 E.
pTb
Qb
QTv
Qya
Qyf
Qof
Qol
HS1
HS2
QS1
G1
G2
L1
D1

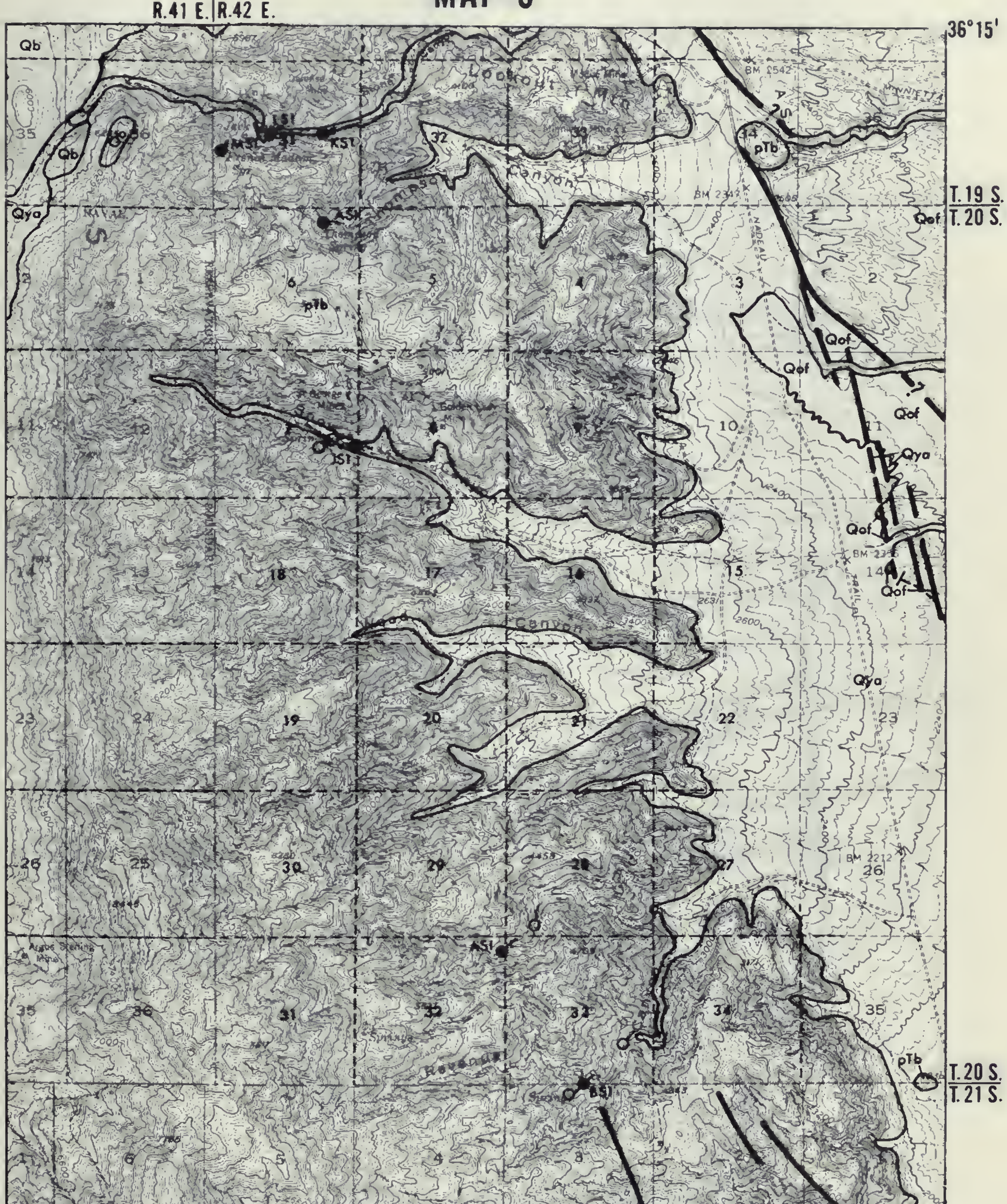
MAP 6


Panamint Springs
Qoi
BM 1760
BM 1570
BM 1566
ROUTE
BM 1548
BM 1542
BM 1575
Qp
Qya
Qof
Qyf
Qb
QTv
pTb
T.18 S.
T.19 S.
R.42 E.
R.43 E.
36°15'

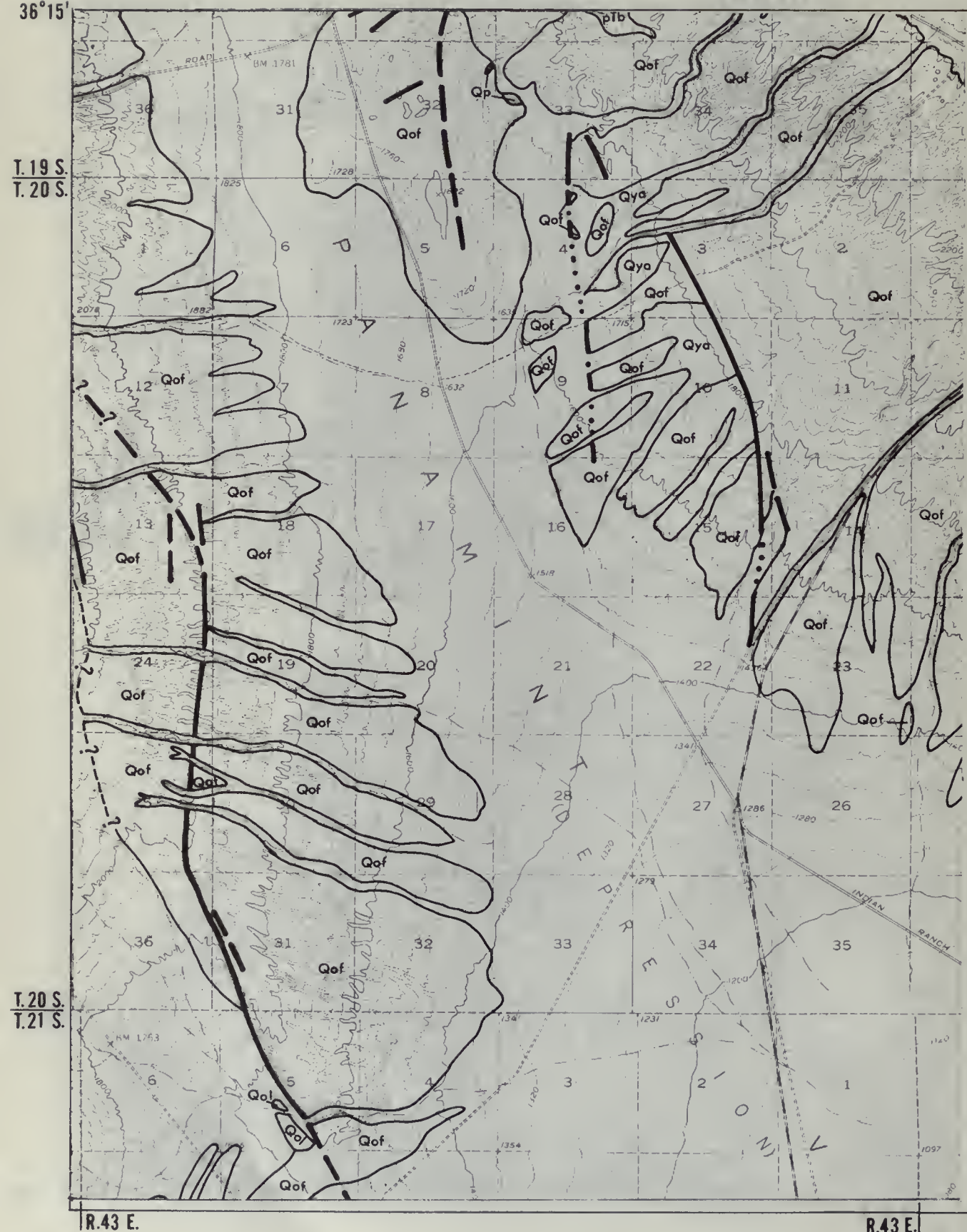
MAP 7


T. 18 S.
T. 19 S.
36°15'
R. 43 E.
MINNIETTA ROAD
BM 1672
BM 2326
Qya
Qof
Qb
QTc
QTv
Qp
pTb

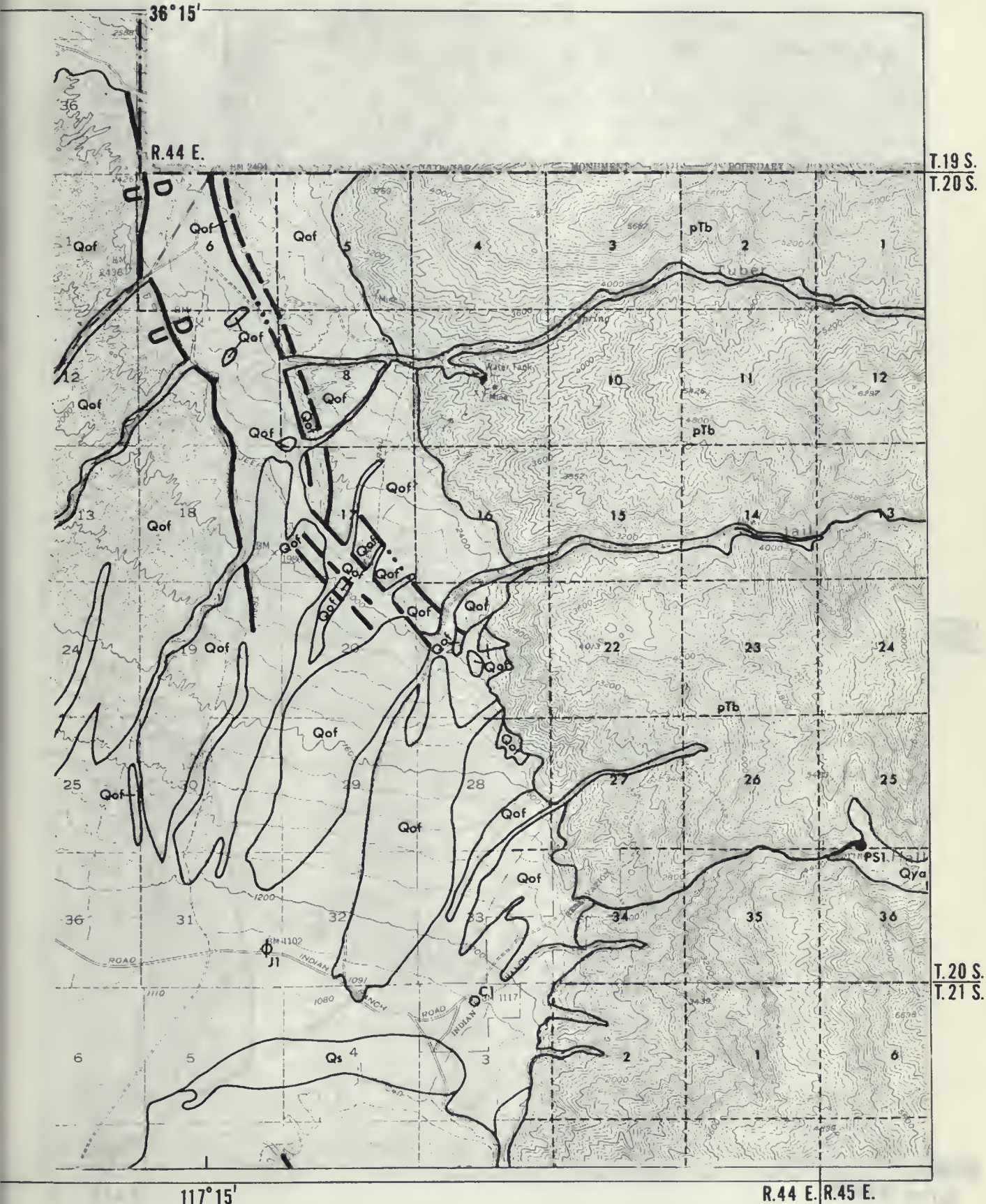
MAP 8


R.41 E.
R.42 E.
36°15'
T.19 S.
T.20 S.
T.20 S.
T.21 S.
117°30'
R.42 E.
Qb
Qya
Qof
pTb
Lookout
Canyon
Knight

MAP 9


36°15'
T. 19 S.
T. 20 S.
T. 20 S.
T. 21 S.
R.43 E.
R.43 E.
pTb
Qp
Qof
Qya
ROAD
BM 1781
BM 1763
INDIAN RANCH
DEPRESSION
ZONE

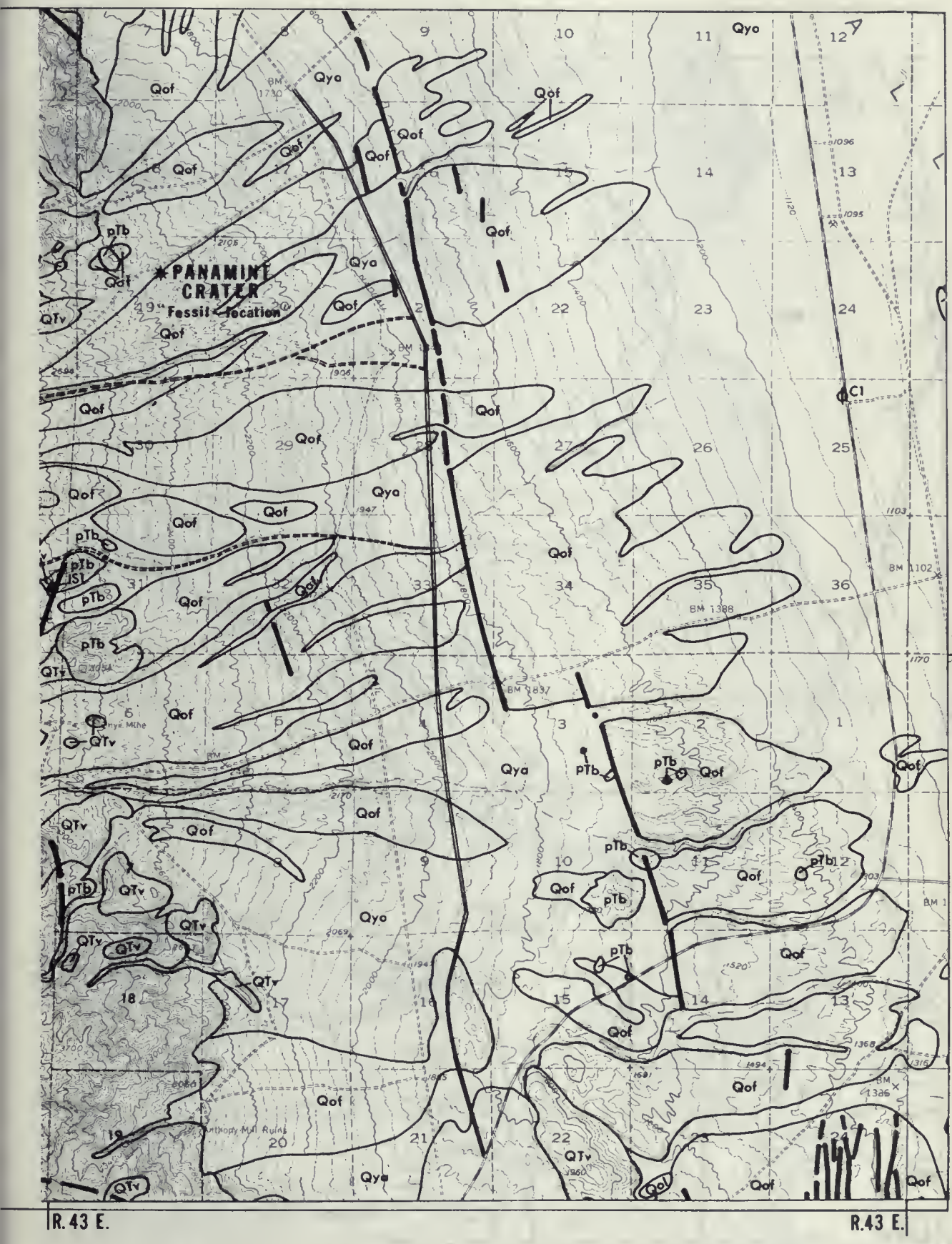
MAP 10


36°15'
R.44 E.
T.19 S.
T.20 S.
T.20 S.
T.21 S.
117°15'
R.44 E.
R.45 E.
Qof
pTb
Qs
Qya
PS1
Jl
Cl
Spring
Water Tank
Mine
ROAD
INDIAN
MONUMENT
BOUNDARY

MAP 11


Maturango Peak
Qya
Qb
Qp
Carricut Lake
Etcheron Valley
pTb
Qof
QTv
DSI
ESI
FSI
GSI
HSI
ASI
RSI
T.21 S.
T.22 S.
36°00'
117°30'
R.42 E.
R.42 E.

MAP 12


PANAMINT CRATER
Fossil location
Qof
Qya
Qyo
QTv
pTb
T. 21 S.
T. 22 S.
R. 43 E.
R. 43 E.
36°00'

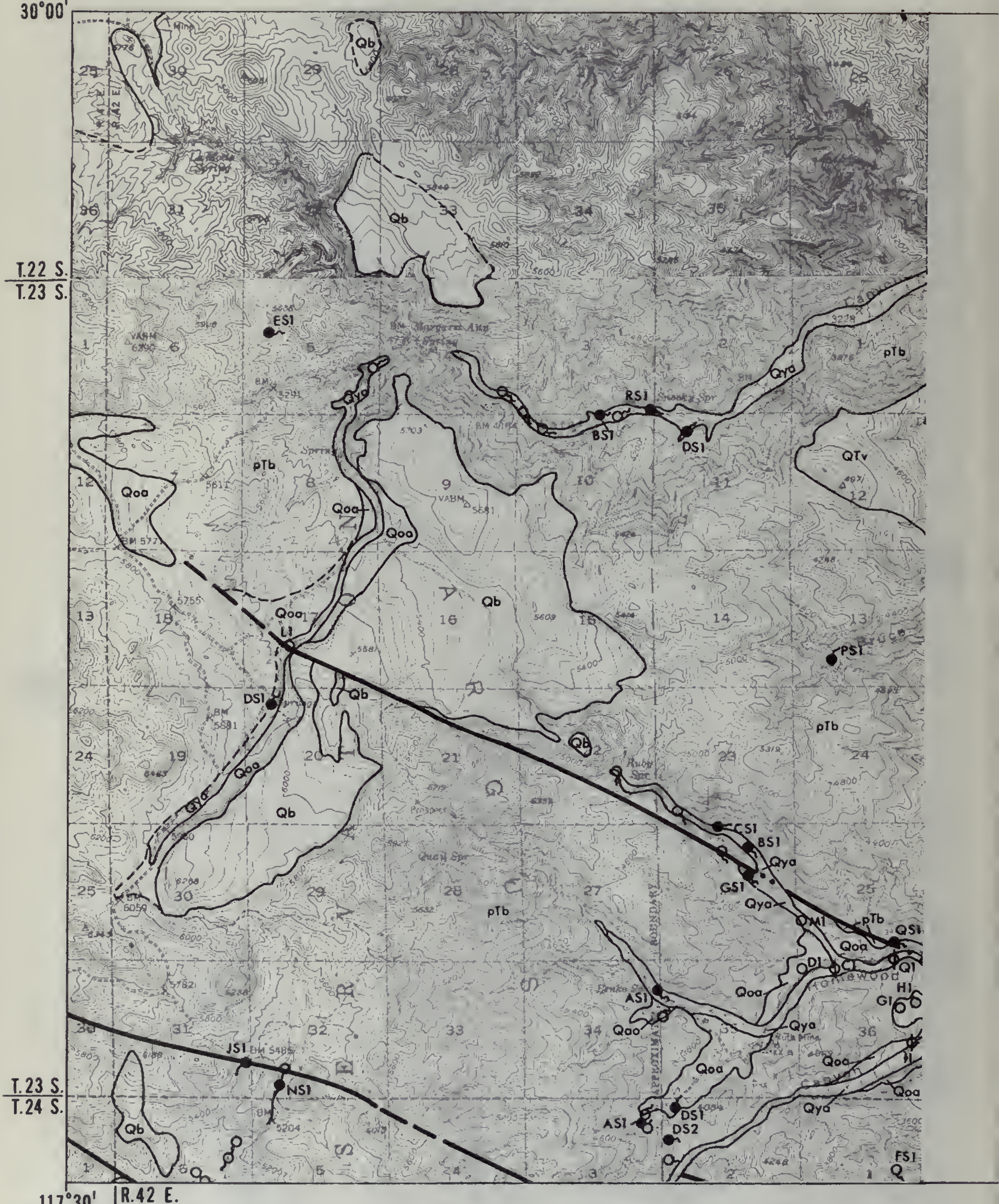
MAP 13


Warm Sulphur Springs
Stage Station
Ruins
Ballarat
Cem.
Post Office
Spring
Chris Wiehe Camp
Canyon
Pleasant
Middle
Park
Goldbank Mine
Qs
Qof
Qya
Qol
Qoll
Qal
Qp
CS1
M1
H1
J1
I1
D1
G1
G2
E1
E2
F1
MS1
KS1
DEPRESSION
VALLEY
PANAMINT
T. 21 S.
T. 22 S.
36°00'
117°15'
R.44 E.
R.45 E.

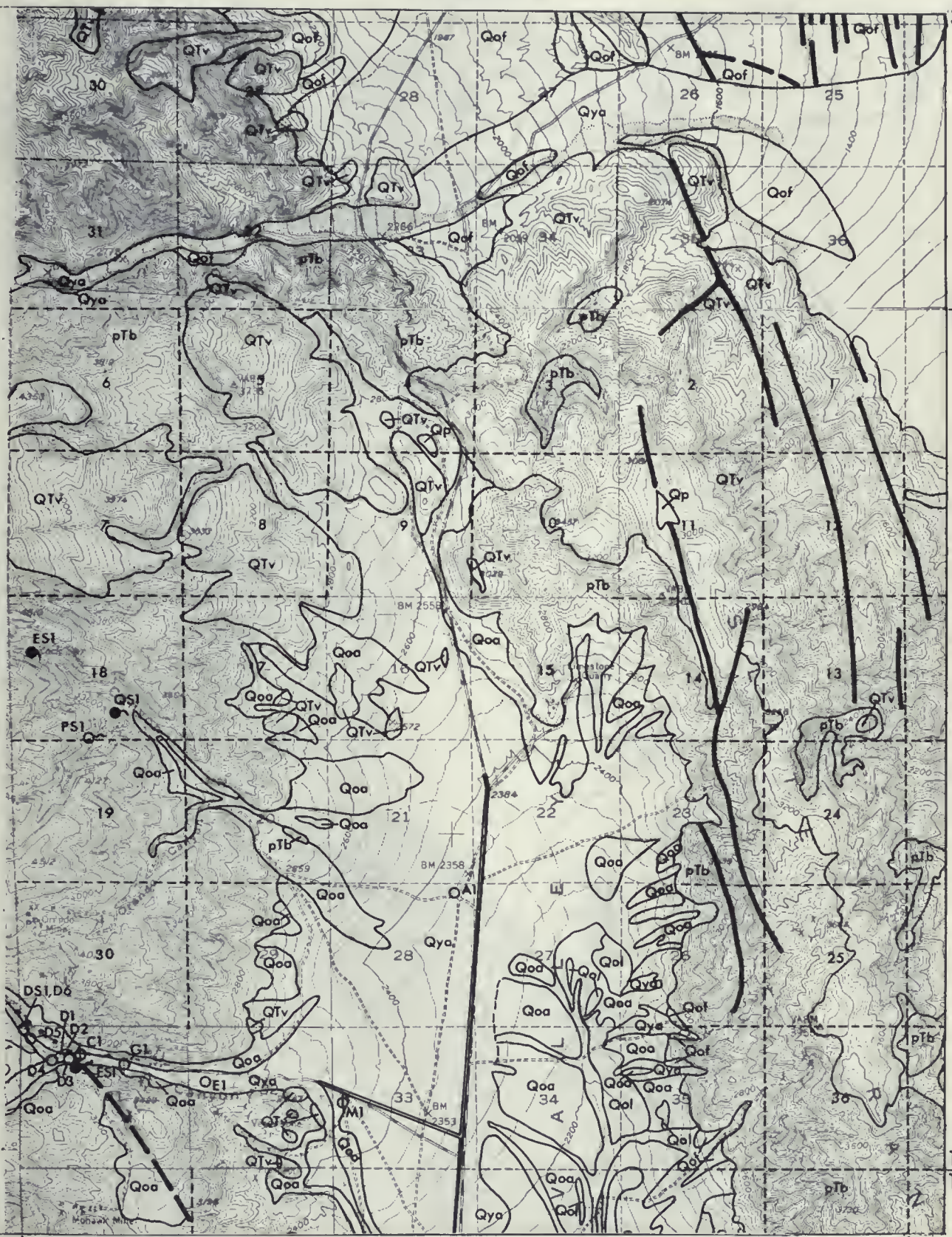
MAP 14

T. 21 E.
T. 22 E.
R.45 E.
R.46 E.
36°00'
JS1
HS1
LS1
LT
DS1
RSN
M1
MS1
pTb
Qya
Qp
Spring
Panamint
Canyon
Porter Peak
Porter Mine
Hudson River Mine
Wyoming Mine
Hemlock Mine
Stone Corral
Middle Park
Clair Camp
Ratcliff Mine
Mollie Gibson Mine
Surprise Canyon
VABM

MAP 15


30°00'
T.22 S.
T.23 S.
T.23 S.
T.24 S.
117°30'
R.42 E.
Qb
Qoa
Qya
pTb
QTv
ES1
RS1
BS1
DS1
PS1
L1
CS1
GS1
M1
QS1
D1
Q1
H1
G1
AS1
DS2
JS1
NS1
FS1
VABM
Quail Spr
Ruby Spr

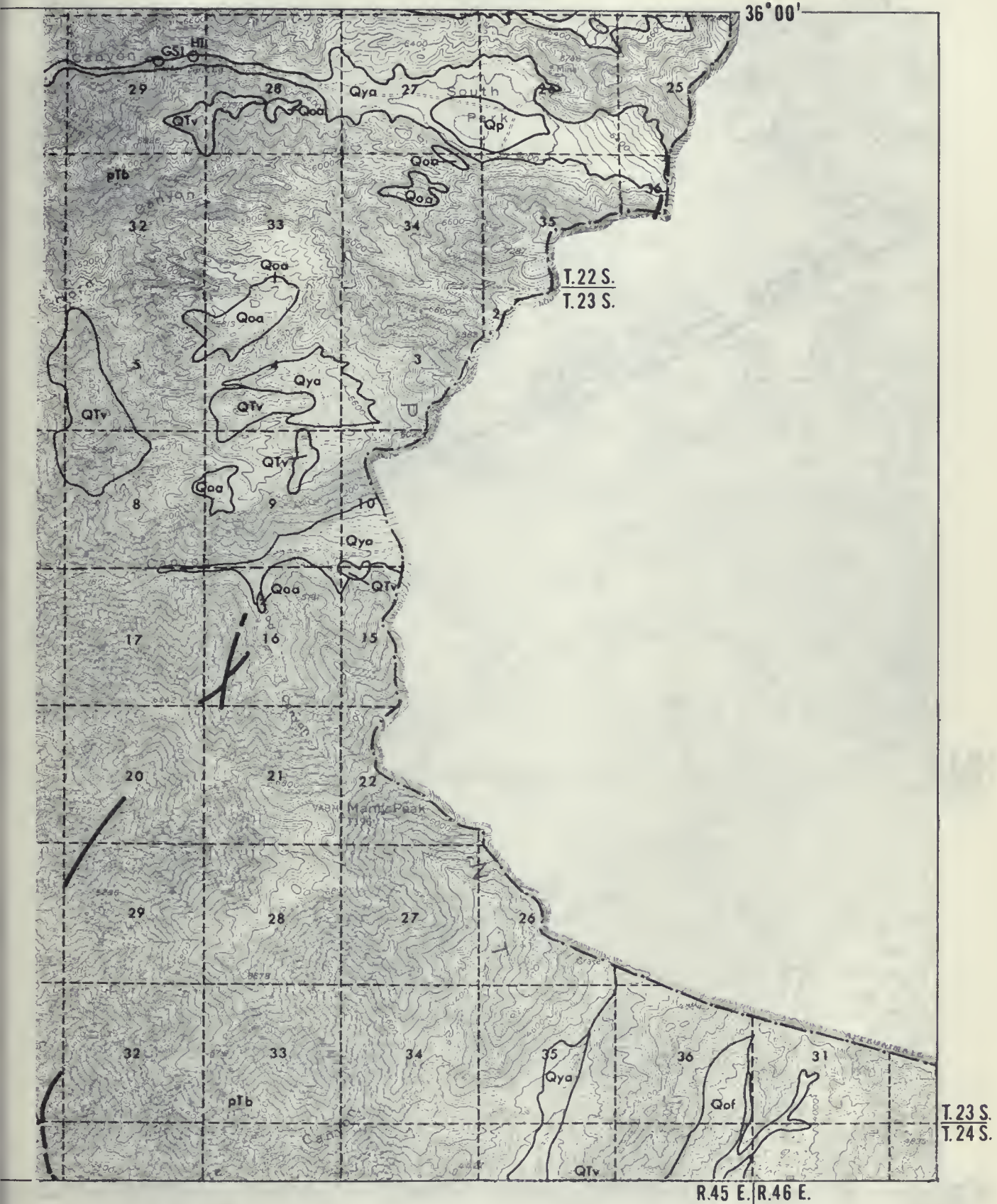
MAP 16


36°00'
T. 22 S.
T. 23 S.
T. 23 S.
T. 24 S.
R. 43 E.
R. 43 E.
QTv
Qof
Qya
pTb
Qp
Qoa
Qol
ES1
QS1
PS1
DS1,D6
D1
D2
D5
D3
D4
C1
G1
E1
M1
A1
BM 2358
BM 2353
BM 2559
Mohawk Mine
VALLEY

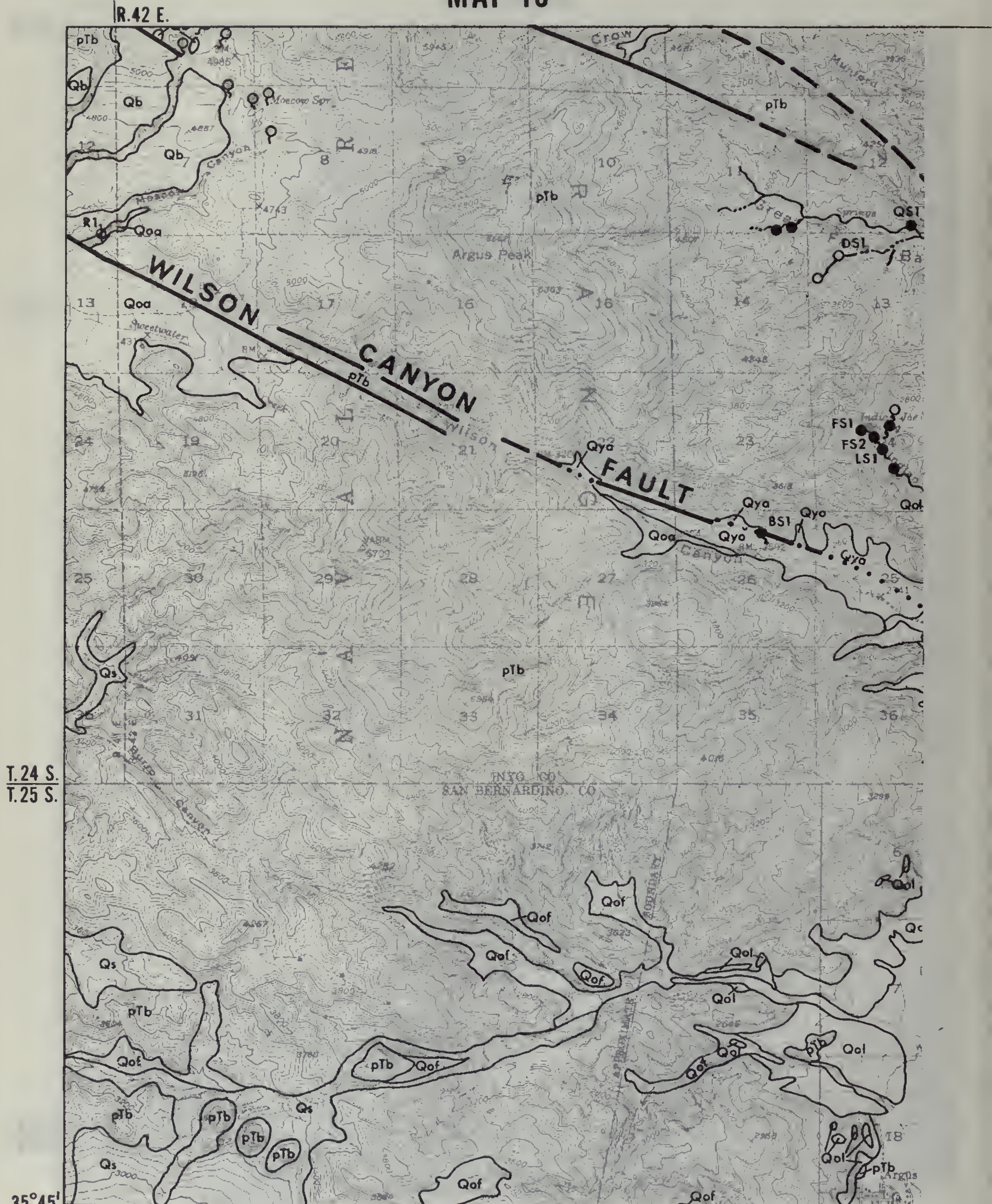
MAP 17


36°00'
T. 22 S.
T. 23 S.
T. 23 S.
T. 24 S.
117°15'
R.44 E.
R.45 E.
PANAMINT
Qof
Qyo
Qp
Qol
Qs
QsΣ
QTv
QTc
pTb
Rli
Manly Fan
Wedlands Spring

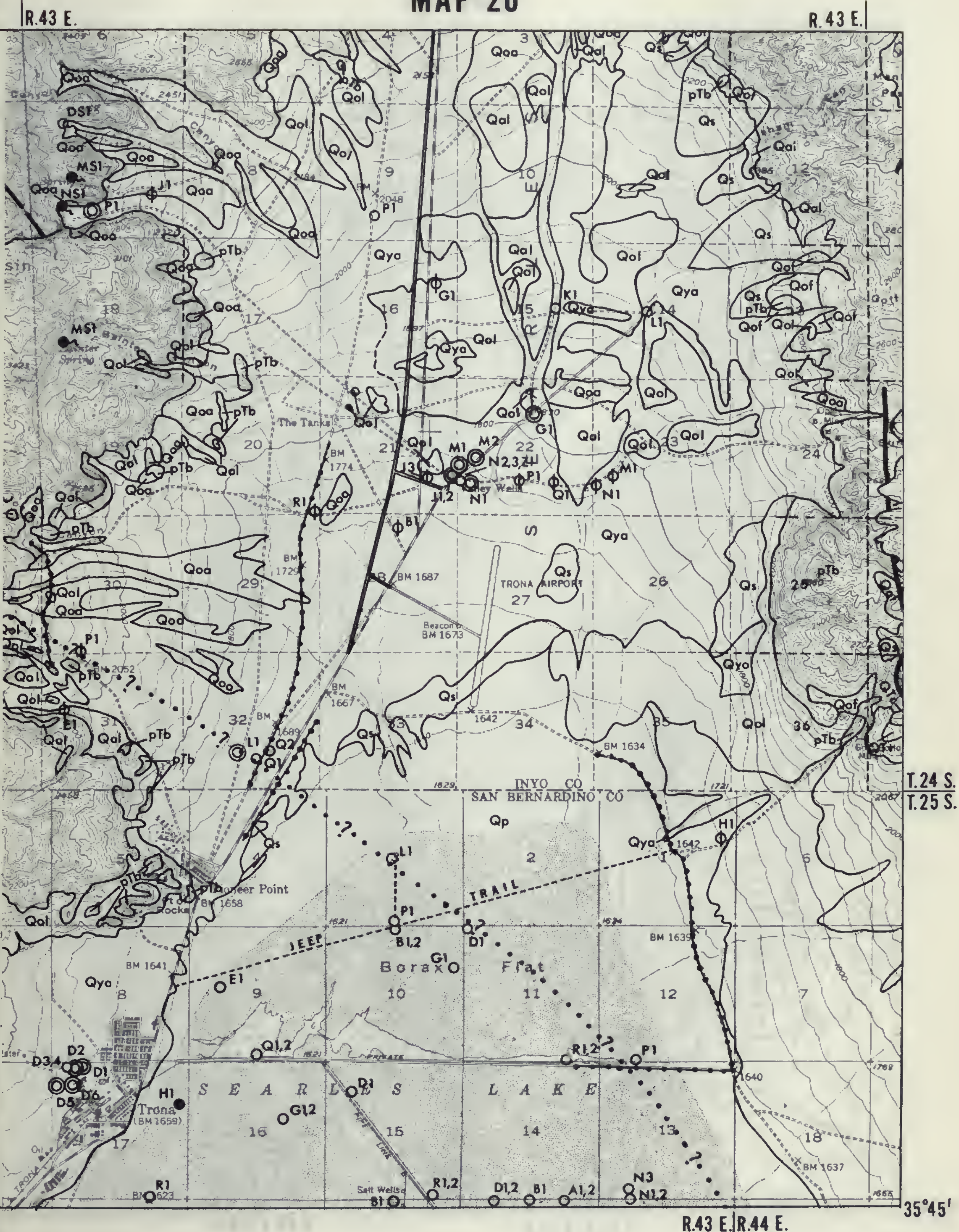
MAP 18


36°00'
Canyon
GSI
Hill
29
28
Qya
27
South
Park
Qp
25
QTv
Qoa
pTb
Qoa
Canyon
36
32
33
34
35
Qoa
T. 22 S.
T. 23 S.
Qoa
2
3
5
Qya
QTv
QTv
QTv
Qoa
8
9
10
Qya
Qoa
QTv
17
16
15
20
21
22
Mam Peak
29
28
27
26
32
33
34
35
Qya
36
31
pTb
Qof
T. 23 S.
T. 24 S.
QTv
R.45 E.
R.46 E.

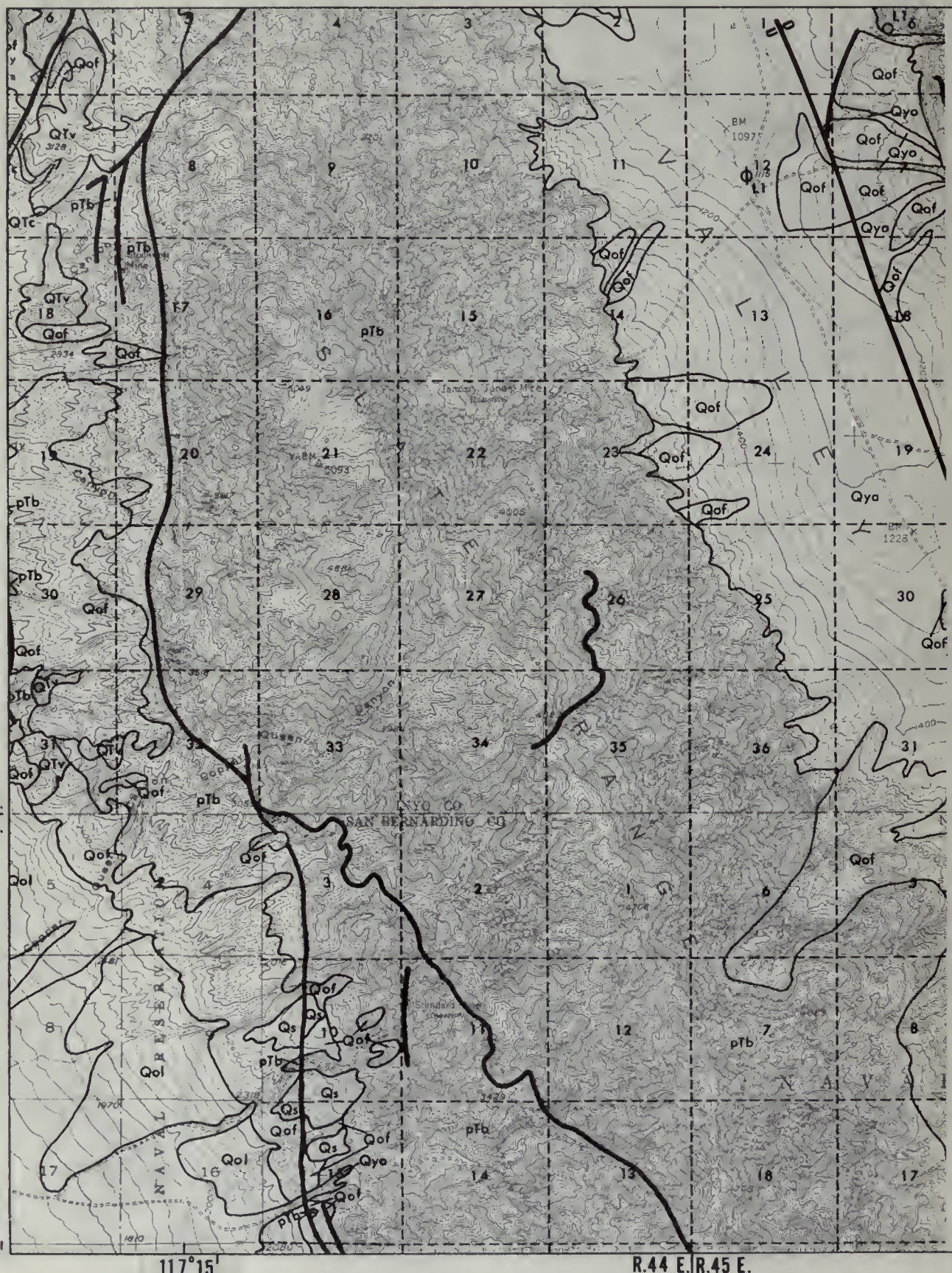
MAP 19


R.42 E.
WILSON CANYON FAULT
Argus Peak
pTb
Qb
Qoa
Qya
Qyo
Qs
Qof
Qol
QS1
DS1
FS1
FS2
LS1
BS1
R1
INYO CO
SAN BERNARDINO CO
T.24 S.
T.25 S.
35°45′
117°30′
R.42 E.
R.43 E.

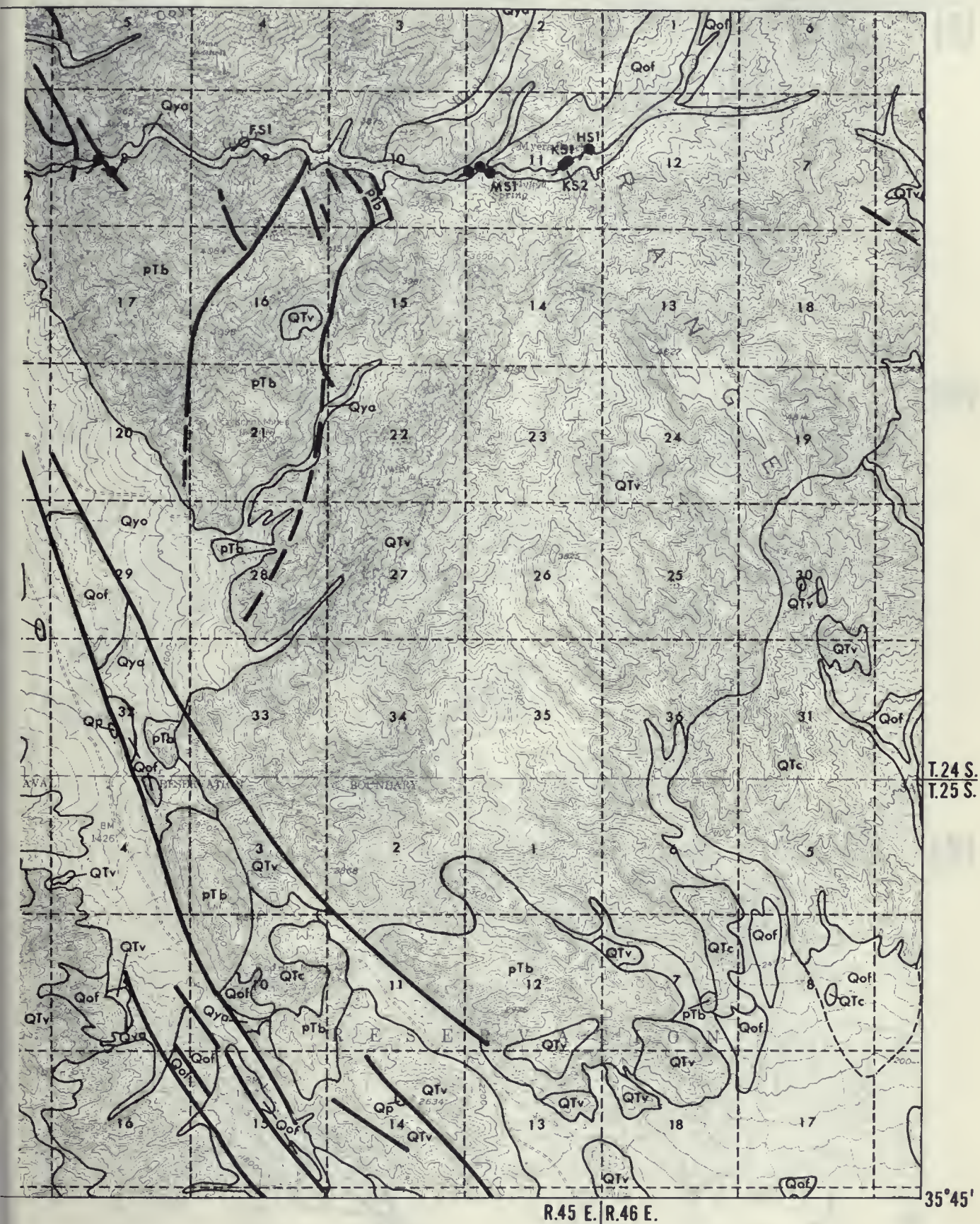
MAP 20


R.43 E.
R.43 E.
T.24 S.
T.25 S.
35°45'
R.43 E.
R.44 E.
The Tanks
TRONA AIRPORT
Beacon
INYO CO
SAN BERNARDINO CO
Pioneer Point
JEEP TRAIL
Borax Flat
SEARLES LAKE
Trona
(BM 1659)
Salt Wells
PRIVATE

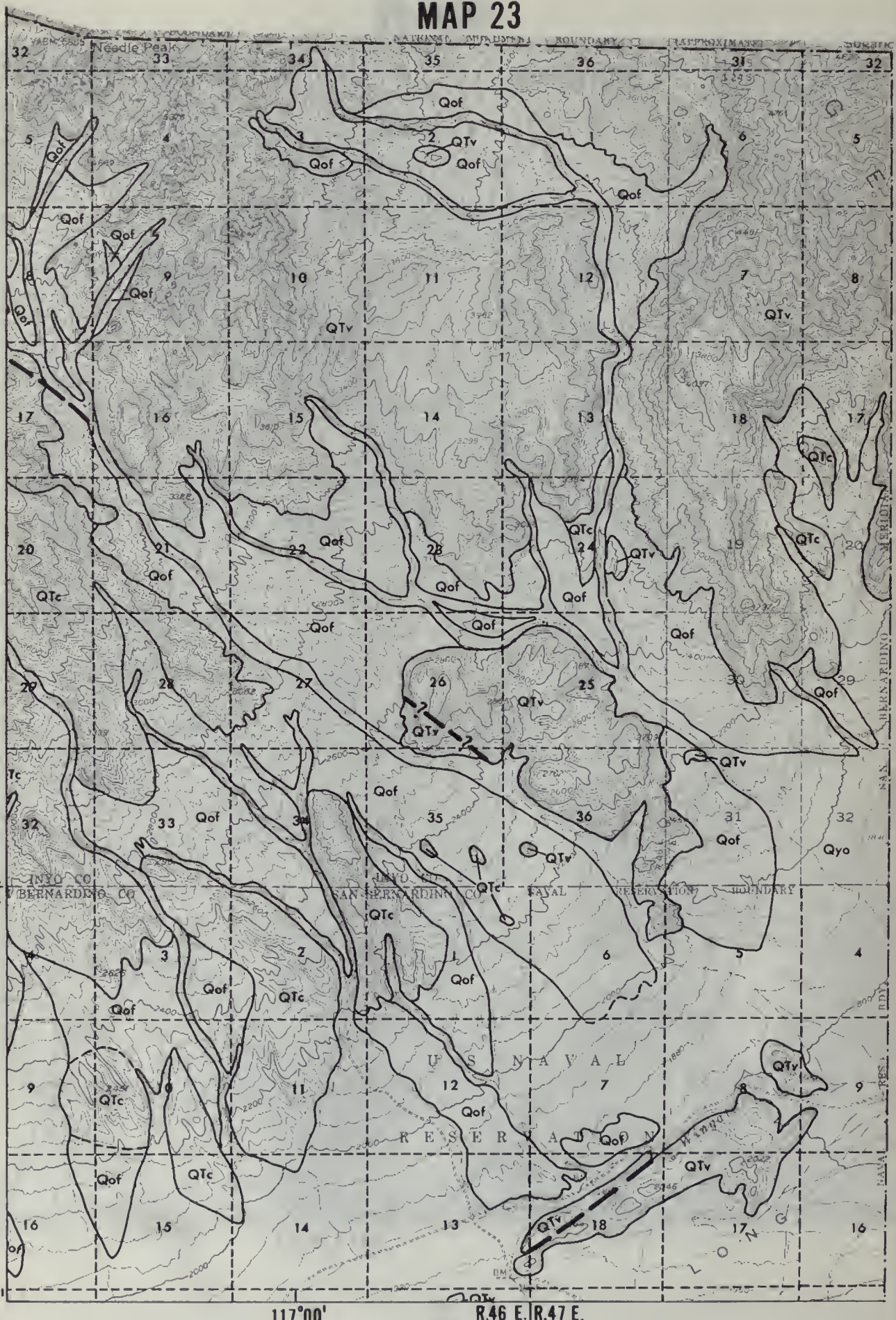
MAP 21


Qof
QTv
pTb
QTc
Qyo
Qol
Qs
Qya
T.24 S.
T.25 S.
35°45'
117°15'
R.44 E.
R.45 E.
SAN BERNARDINO CO.
NAVAL PRESERVE

MAP 22


Qya
Qof
FS1
HS1
KS1
MS1
KS2
QTv
pTb
Qyo
Qp
QTc
T. 24 S.
T. 25 S.
35°45'
R.45 E.
R.46 E.

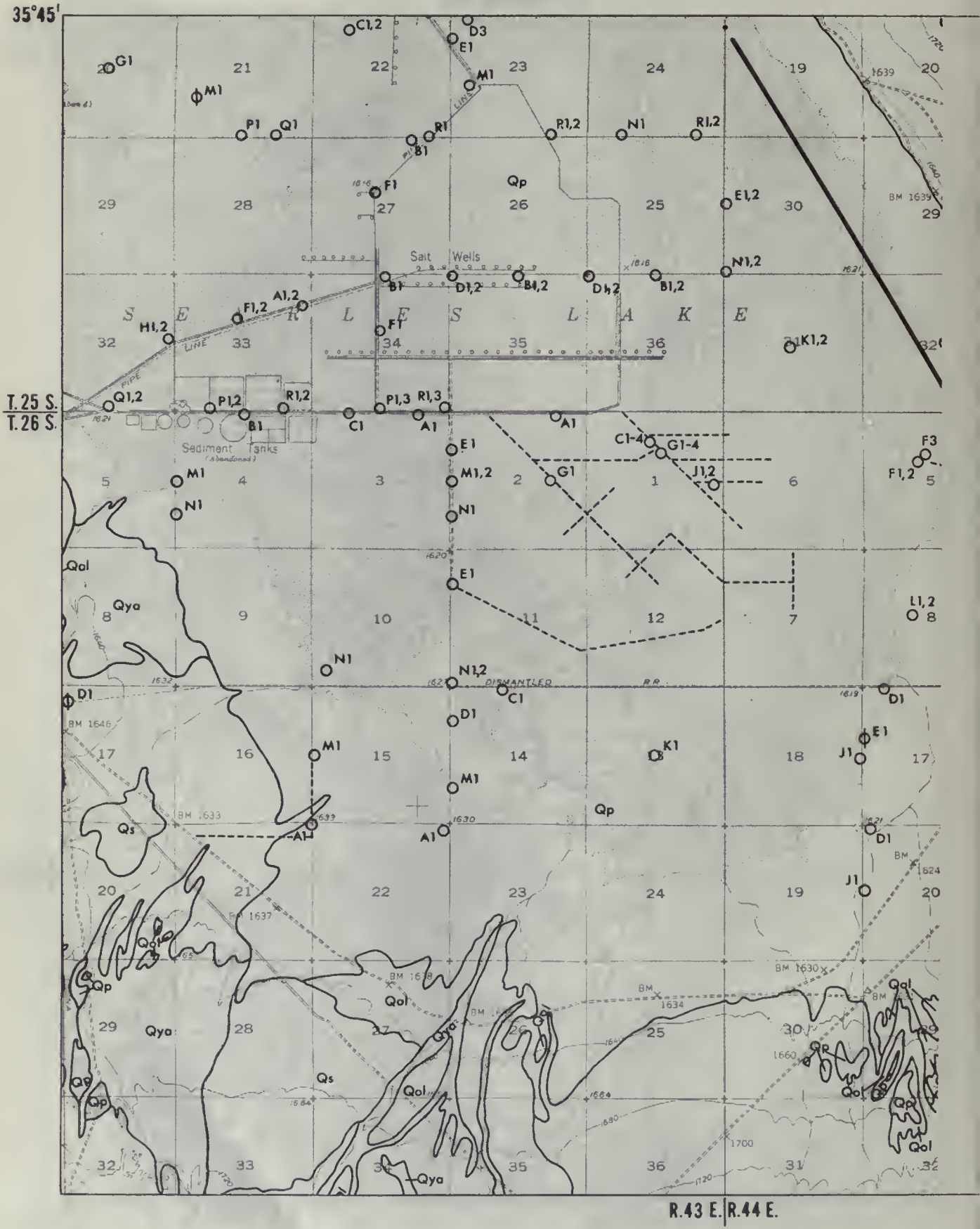
MAP 23


T.23 S.
T.24 S.
T.24 S.
T.25 S.
35°45'
117°00'
R.46 E.
R.47 E.
Needle Peak
Qof
QTv
QTc
Qyo
INYO CO
SAN BERNARDINO CO
U S NAVAL
RESERVATION
BOUNDARY
Wash

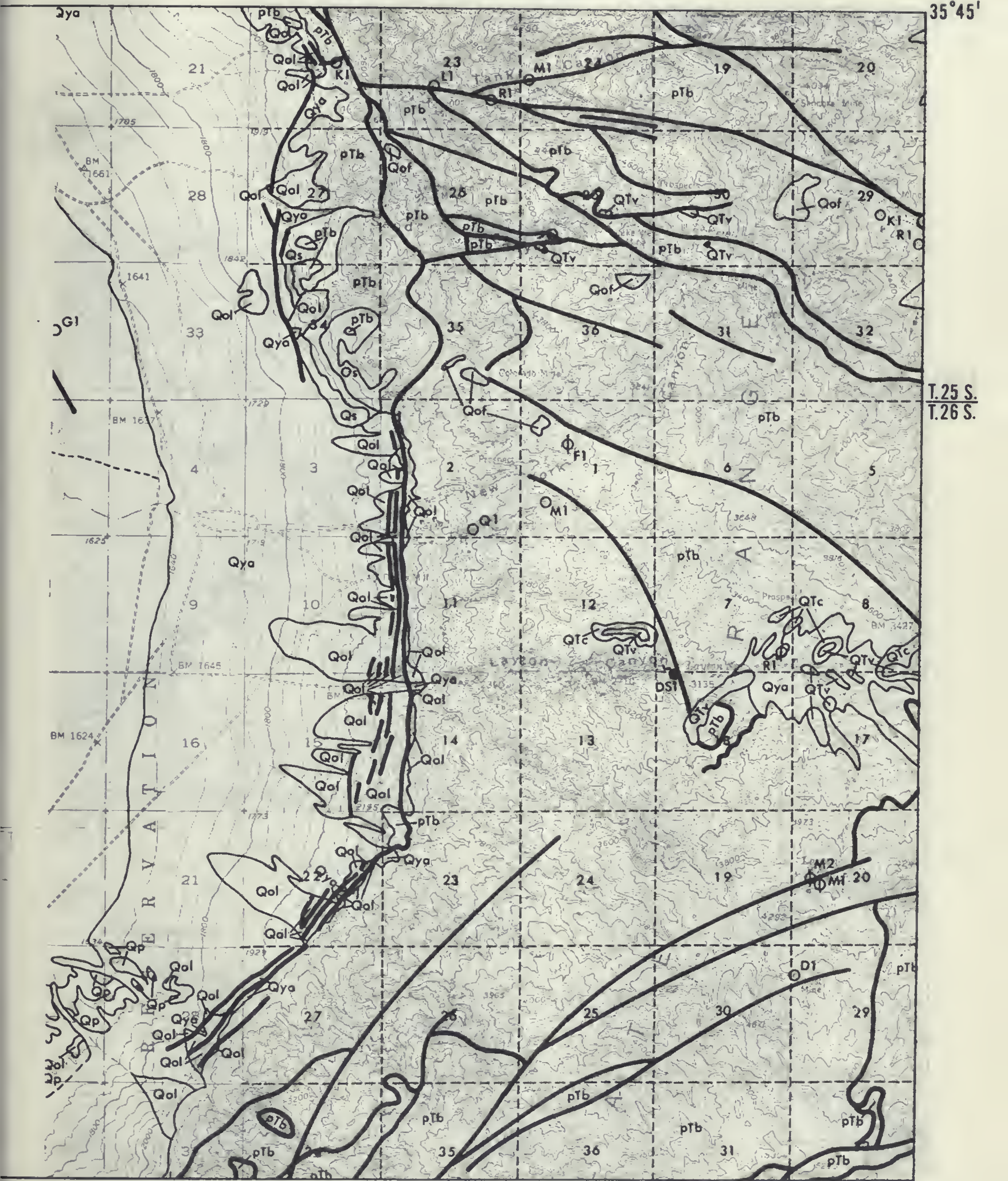
MAP 24


35°45'
T. 25 S.
T. 26 S.
T. 26 S.
T. 27 S.
R.42 E.
R.43 E.
Argus
Trona
South Trona
Westend
pTb
Qol
Qof
Qs
Qya
Qp
Q1
M1
N1
F1
F2
F3

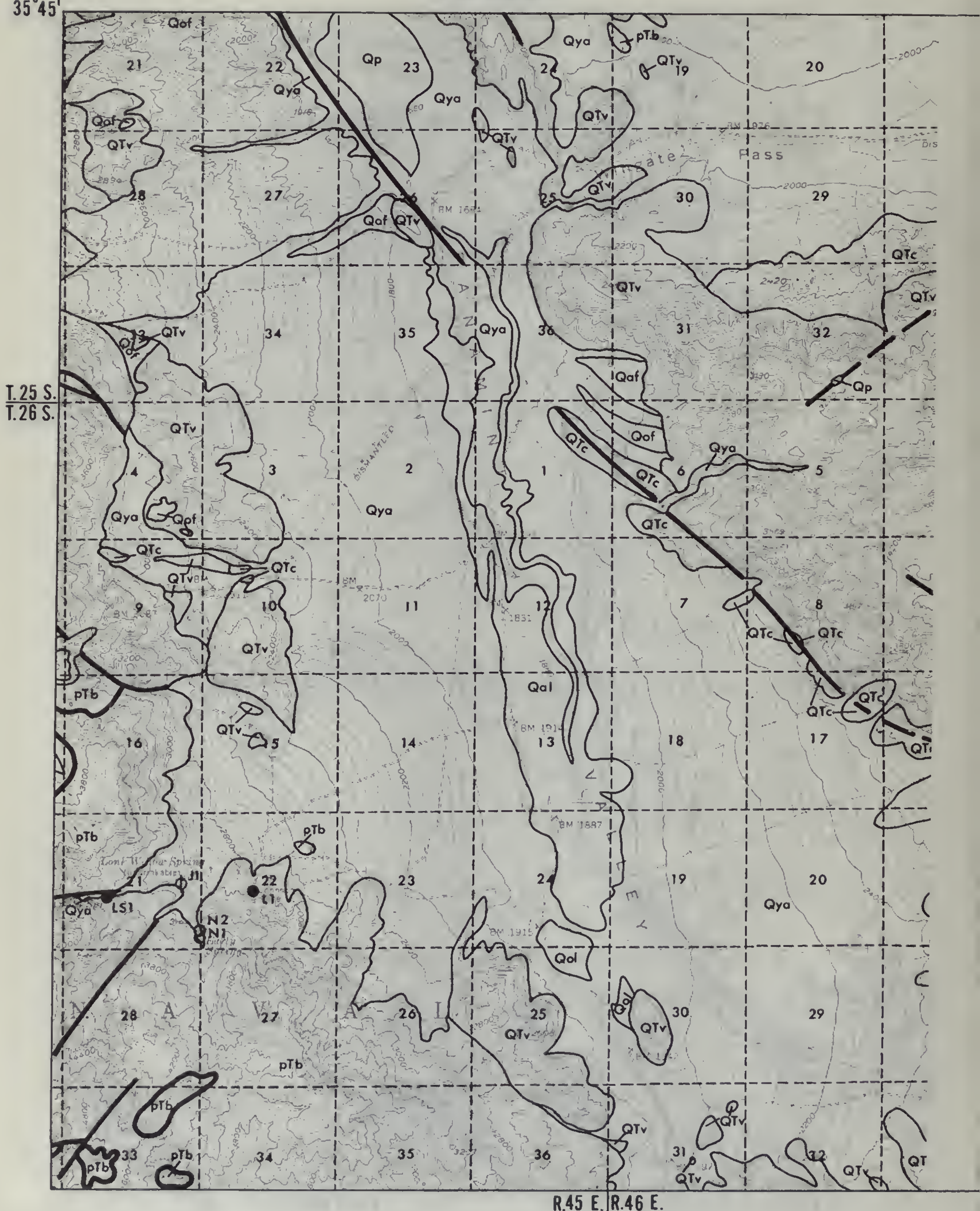
MAP 25


35°45'
T. 25 S.
T. 26 S.
R. 43 E.
R. 44 E.
SELES LAKE
Salt Wells
Sediment Tanks
(Abandoned)
PIPE LINE
DISMANTLER
RR
Qp
Qol
Qya
Qs
BM 1646
BM 1633
BM 1637
BM 1639
BM 1630
BM 1634
BM 1624
1620
1630
1634
1640
1660
1664
1680
1700
1720

MAP 26


35°45'
T.25 S.
T.26 S.
117°15'
R.44 E. R.45 E.
Layton Canyon
pTb
Qol
Qya
Qof
QTv
QTc
Qs
Qp
K1
L1
M1
R1
F1
Q1
M2
D1
DS1
G1

MAP 27

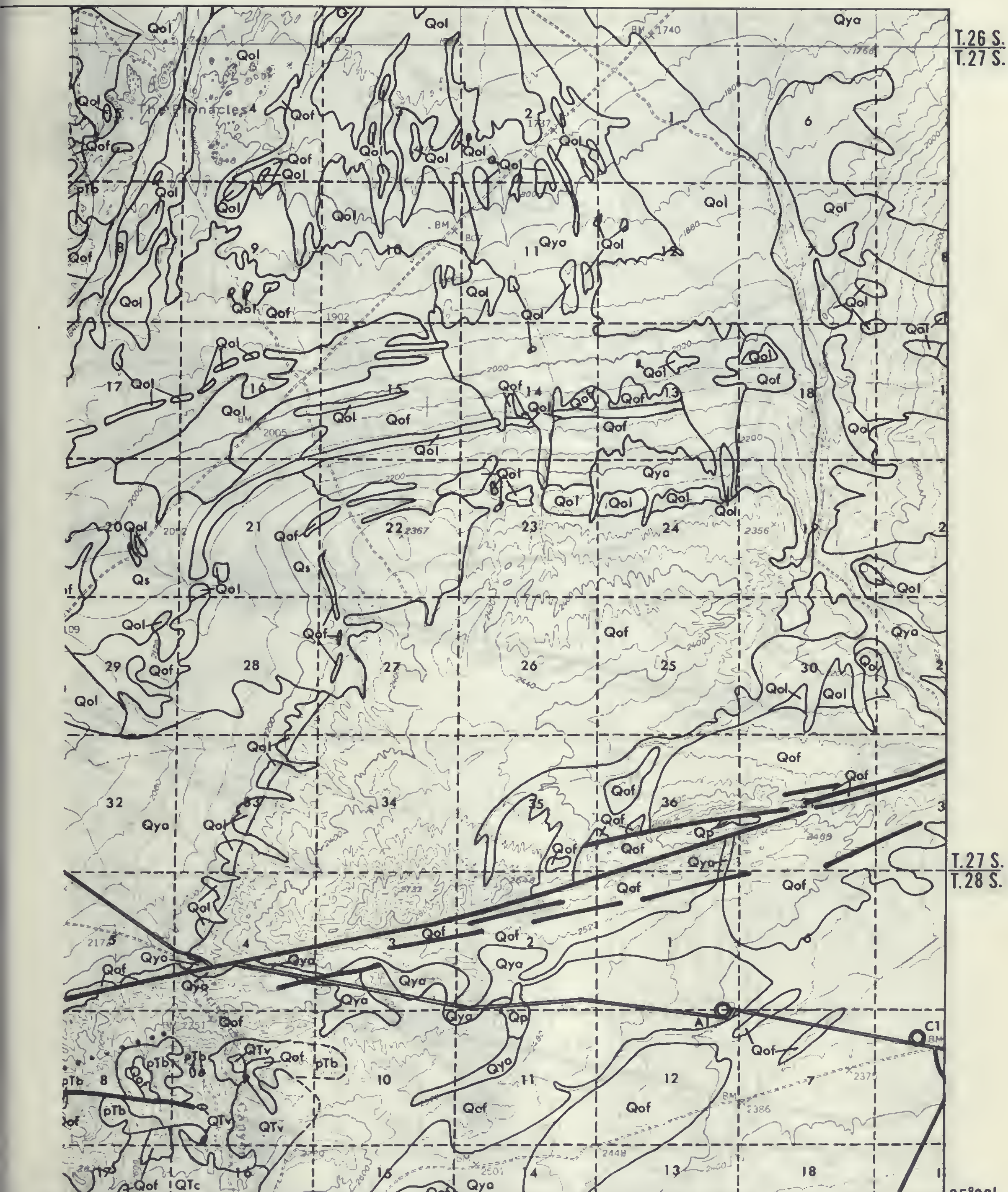

35°45'
T.25 S.
T.26 S.
R.45 E.
R.46 E.
Pass
Qof
Qya
Qp
QTv
pTb
Qaf
QTc
Qal
LS1
N2
N1
L1
J1
BM 1676
BM 1851
BM 1914
BM 1887
BM 1915
DISMANTLED

MAP 28

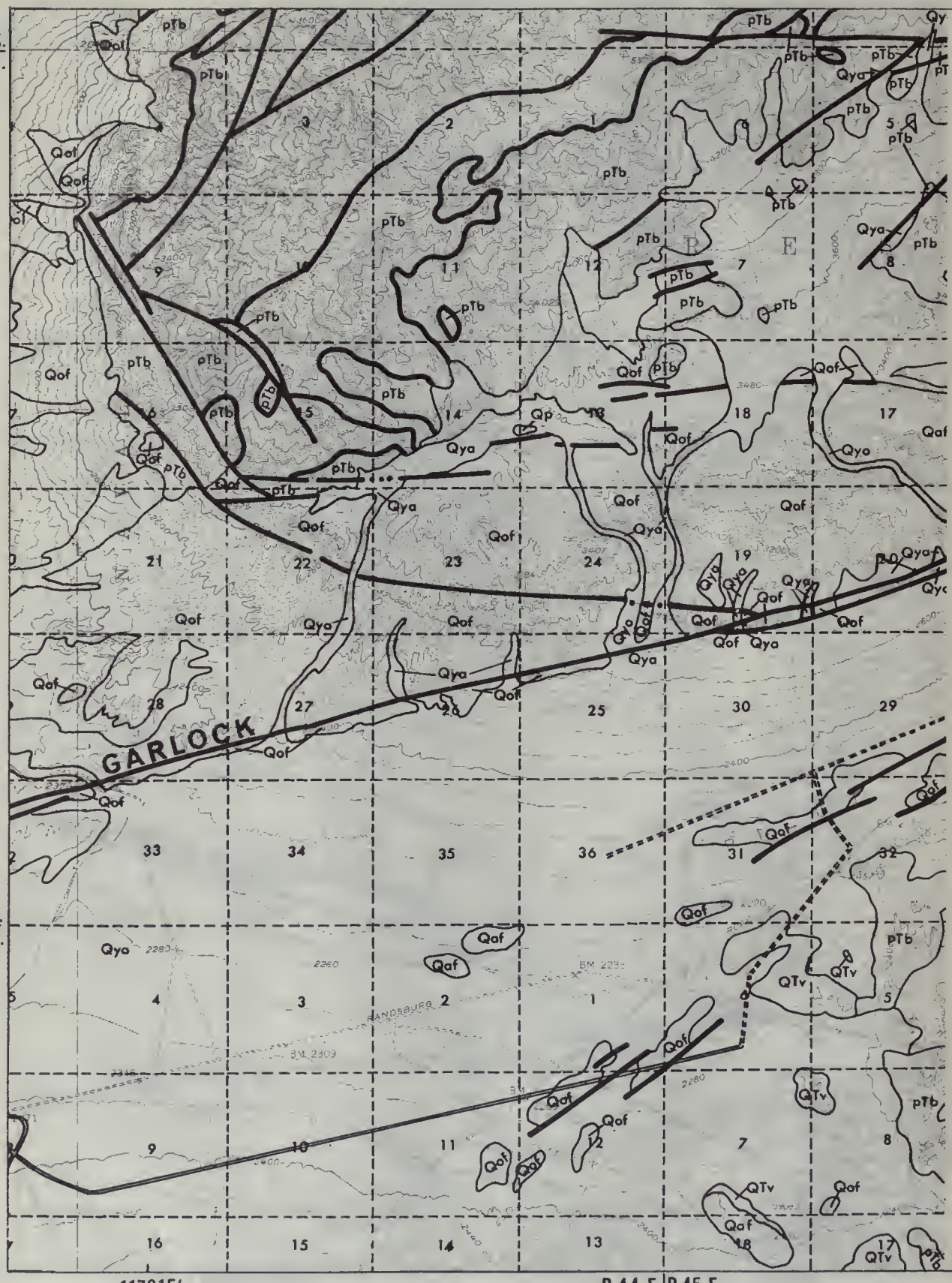

35°45'
T. 25 S.
T. 26 S.
117°00'
R. 46 E.
R. 47 E.
Brown Mountain
ABANDONED
MONOPAIL
MANTLED
Qyo
Qof
QTc
QTv
Qya
Qp
QSl

MAP 29

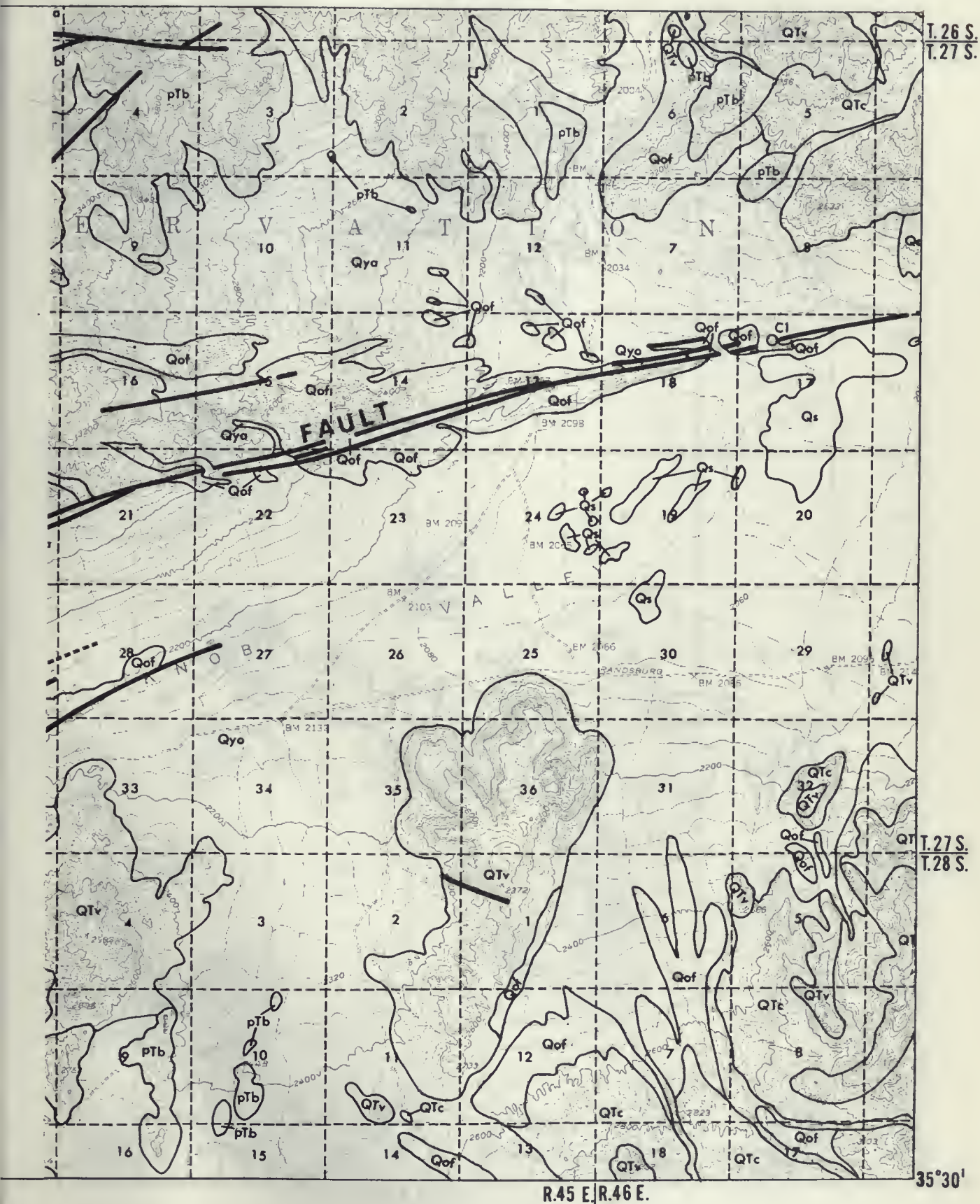
MAP 30



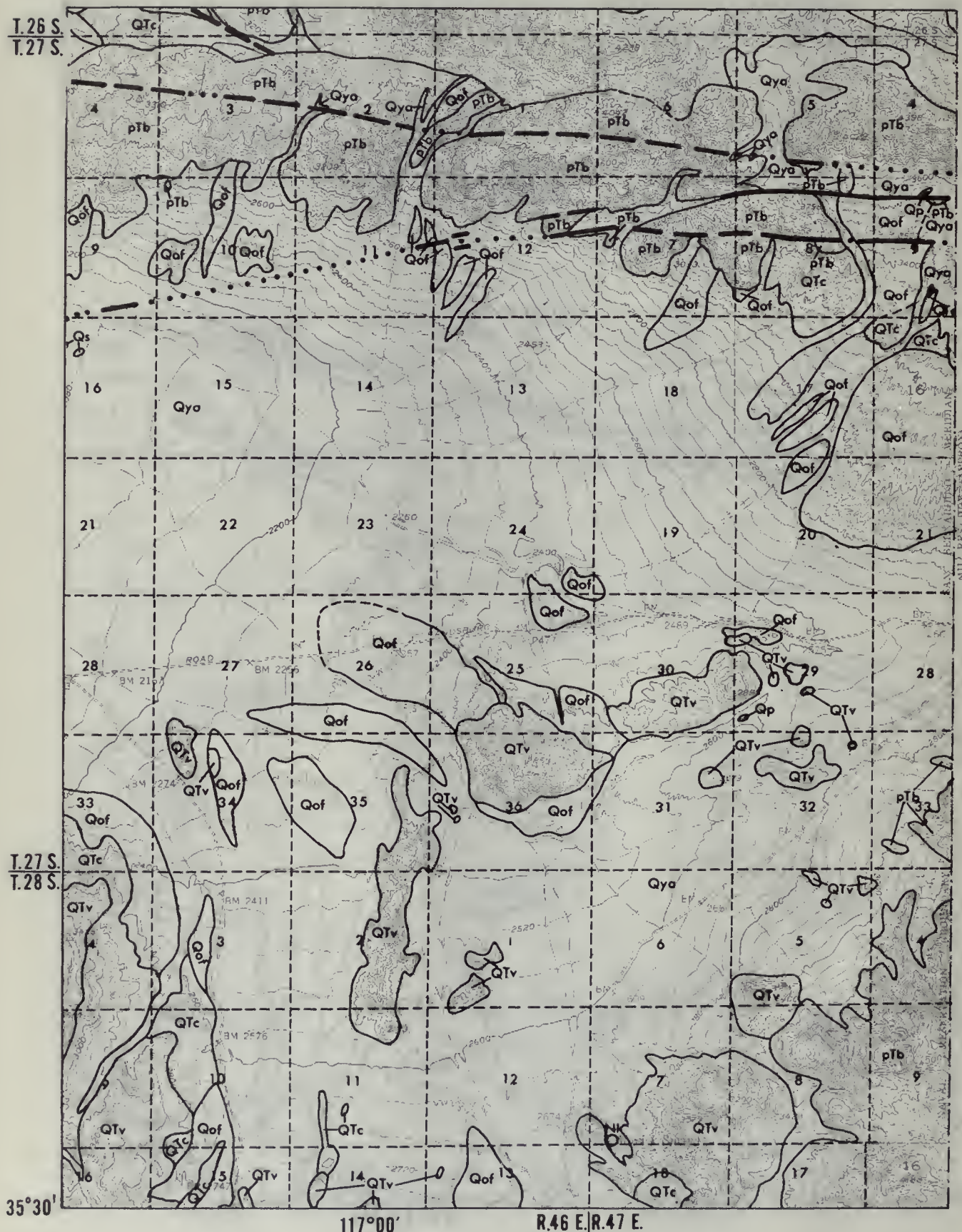
MAP 31


T.26 S.
T.27 S.
T.27 S.
T.28 S.
GARLOCK
HANDSBURG
BM 2309
BM 2231
117°15'
R.44 E.
R.45 E.
pTb
Qof
Qaf
Qya
Qyo
Qp
QTv

MAP 32


T. 26 S.
T. 27 S.
T. 27 S.
T. 28 S.
35°30'
R.45 E.
R.46 E.
FAULT
pTb
QTv
QTc
Qof
Qya
Qyo
Qs
Qofi
C1
BM 2034
BM 2098
BM 2103
BM 2133
SANDSBURG

MAP 33


T. 26 S.
T. 27 S.
T. 27 S.
T. 28 S.
35°30'
117°00'
R.46 E.
R.47 E.
QTc
QTv
Qof
Qya
Qp
Qs
pTb
BM 2411
BM 2576
ROAD